An Investigation of Relationship Quality and Supplier Performance in New Zealand Red Meat Supply Chains

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Abstract

Supplier relationships and performance have become increasingly important in agri-food supply chains. This research aimed to investigate buyer-supplier relationships in the New Zealand red meat industry. Specifically, this meant examining how relationship quality, as well as supplier characteristics and relationship attributes affect supplier performance.

The analysis improved the conceptualisation of relationship quality by bringing together constructs from the relationship marketing and social capital literature. This established that relationship quality and social capital were closely related constructs. By combining social capital and relationship quality this created a broader measure of the overall strength of the relationship. The findings show that improving supplier performance requires taking into account both supplier characteristics and relationship attributes. Furthermore, relationship quality played a significant mediating role between all the relationship factors and supplier performance.

The implications of this research are that there are specific ways buyers can improve supplier performance. This involves identifying and selecting suppliers who have superior ability, motivation and customer focus. They also need to avoid selecting suppliers with high levels of self-direction. Improving supplier performance also involves influencing relationship attributes and improving the quality of relationships with suppliers. In particular, processors need to ensure that suppliers experience positive value from the supply relationship. Furthermore, they need to manage the interaction between specific assets, dependence and use of coercive power.

Keywords: Supplier performance, relationship quality, social capital, supplier characteristics, buyer-supplier relationships, New Zealand, Red meat industry,

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Finally, I would like to acknowledge the One who is the source of all knowledge and declares that “The mind of the prudent acquires knowledge, and the ear of the wise seeks understanding. Proverbs 18:15

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Chapter 1: Introduction

1.1 Buyer-supplier relationships in a changing global marketplace

Matt Simister, commercial director for Tesco Group Food, declared in 2013 that, "The transactional model of supplier relationships is too wasteful and we can no longer afford to do this in today's multi-channel world" Alvarez, Mcloughlin, and Shelman (2014, p. 1); (Ulaga & Eggert, 2006). In response to this challenge, Tesco created a new centralised sourcing department for food, and appointed Matt Simister as its head. In 2014 Tesco was the world's third largest supermarket with US$102 billion in sales and 6,700 stores in 12 countries. The goal was to move Tesco away from its historical transactional approach to buying, which focused on short-term cost minimisation, and work on long-term supplier partnerships that would deliver lower total costs and differentiated products (Alvarez et al., 2014).

The need to develop closer relationships with suppliers was not unique to Tesco. The importance of relationships between buyers and suppliers has long been recognised as essential to business performance (Anderson & Narus, 1984; Dyer & Singh, 1998; Ganesan, 1994; Geyskens, Steenkamp, Scheer, & Kumar, 1996; Morgan & Hunt, 1994). This is emphasised by Lambert (2006) who argues that the ultimate success of an individual business is based on its ability to manage and integrate the company's complex network of relationships. The emphasis on relationship management has also been influenced by the global trend towards outsourcing. As a result, firms are increasing their reliance on external organisations to perform critical operations. Consequently, this creates greater dependence on the performance, and behaviour of suppliers (Christopher & Gattorna, 2005; Praxmarer-Carus, Sucky, & Durst, 2013). As a result, the quality of the relationship between buyers and suppliers and their performance has become a critical component of supply chain performance. Improving relationship quality is also recognised by researchers and practitioners as an important source of competitive advantage (Tracey & Vonderembse, 2000; Ulaga & Eggert, 2006). Research has also shown that improved supplier performance provides buyers with a competitive advantage through benefits such as lower costs, improved quality and technological innovation (Tracey & Vonderembse, 2000).

The move away from market transactions has also been noted in agri-food supply chains (Baker & Smyth, 2012; White, 2000). For example, referring to agri-food supply chains, Hobbs and Young (2000) identified that, "Changing consumer preferences, biotechnology, information technology, environmental pressures, credit and risk issues, and the reduction

of global trade barriers" were some of the driving forces behind these changes. As food production has moved from undifferentiated commodity goods to products with diverse characteristics for specific market segments, search and monitoring costs have increased for the exchange parties (Baker & Smyth, 2012; Duffy & Fearne, 2004). These changes have increased uncertainty and resulted in greater use of long-term contracts and other forms of vertical coordination (Gërdoçia, Skreli, Panariti, & Repaj, 2016). The move away from commodity products is because consumers are demanding greater variety and quality in the food they eat. They require a consistent year-round supply of high-quality, safe food (Fischer et al., 2009; Van der Vorst, 2000). They are also concerned with the way their food is produced which includes attributes such as environmental sustainability, animal welfare, fair trade, and organic production (Wognum, Bremmers, Trienekens, van der Vorst, & Bloemhof, 2011). As a result, agricultural products have become more differentiated which puts more pressure on supplier performance. As a result, individual suppliers are less able to be substituted.

Another force driving these changes is that agri-food supply chains entered a new era of volatility after 2007 when food commodity prices reached record levels (Figure 1-1), (Trostle, 2010).

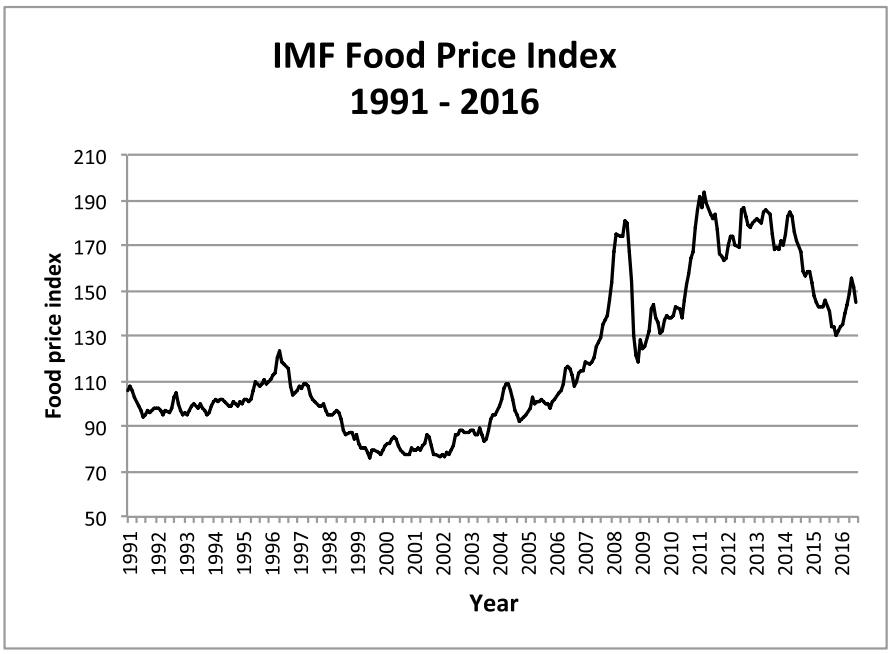

Figure 1-1: IMF global food price index

Source: IMF Statistics: Primary Commodity Prices

For most of the previous decades there was steady food price inflation and a long-term decline in nominal prices for agricultural products (Figure 1-1), (Angus, Burgess, Morris, & Lingard, 2009). This period of stability allowed agri-food supply chains to adapt to the environment of steady changes that were characteristic of this time period. As agricultural investment decisions usually take time to implement it is often difficult to adapt production and processing systems in the short term (Gow & Swinnen, 1998). Therefore, the rapid changes that are characteristic of the current period create difficulties for all parties in the supply chain. This new era of volatility (Figure 1-1) has created a great deal more risk and uncertainty in the supply chain which has led to a lack of investment. As Matt Simister from Tesco explained, “It throws in uncertainty, which has led to volatility, which leads to a lack of investment and then lack of innovation. The real problem we see, is the lack of confidence to invest" (Russell, 2013, p. 1). This uncertainty is exacerbated by short-term spot market relationships between suppliers and buyers. These concerns motivated Tesco and other food companies to seek closer relationships with their suppliers, as well as selecting suppliers based on performance and investing in their development (Hingley, Lindgreen, & Casswell, 2006).

This strategy of building long-term relationships raises a number of questions such as:

1) What supplier selection criteria should be used to identify suppliers that have the potential to form higher quality relationships and improved performance?
2) What do companies need to do to improve the relationships with their suppliers and improve their performance?

These questions highlight the need for a greater understanding of the nature and processes of improving supply chain relationships and performance. These issues will be at the centre of this research.

1.2 The need for research on relationship quality and supplier performance

The growing emphasis on relationships and supply chain performance highlights the need for research on supplier relationship management. This has placed relationship management at the centre of organisational research (Schulze & Lees, 2014). For example, recently academic journals have dedicated special issues on the topic of managing and developing key supplier relationships. This can also be seen in a review of research on import activities of firms. Aykol, Palihawadana, and Leonidou (2013, p. 231) report that, “Relationships between importers and exporters were the dominant field of research within importing […], with the

thrust of research centring on behavioural interactions between international buyers and sellers". Despite reviewing a large amount of existing research on relationships, Aykol et al. (2013) highlighted the need for future research to focus on relationship quality. The need was further emphasised by Fawcett, Fawcett, Watson, and Magnan (2012, p. 44) who state that, "Despite intense interest in the collaborative supply chain, researchers know relatively little regarding the collaborative process through which companies combine and configure resources across organisational boundaries to create distinctive customer value". Some authors have also commented on the lack of theoretical clarity in relationship quality research. For example, Leonidou, Samiee, Aykol, and Talias (2014), in a meta-analysis on exporter-importer relationship quality, commented that the research is characterised by investigating behavioural relationships from diverse and, at times, antithetical, theoretical angles. This has created an unclear, ambiguous and, sometimes, confusing picture of relationship quality. Furthermore, they note the proliferation of constructs and conceptualisations used by researchers and the need to develop these into a core set of constructs (Leonidou et al., 2014). This theoretical diversity was also identified by Athanasopoulou (2009) who reviewed the literature on relationship quality from 1987 to 2007. She found a wide variation in the antecedents and dimensions as well as outcomes of relationship quality with no commonly accepted framework.

These findings highlight a number of points regarding the current state of research on relationship management. First, that relationship quality is an important area of research, and there are still large knowledge gaps in this field. Secondly, that there is little consensus or consistency with regard to the theoretical approaches used in current research. Thirdly, given the wide variety of concepts and constructs, greater clarity in defining and measuring these is needed. This research will aim to address some of these issues.

1.3 The importance of supplier relationships and performance in agri-food supply chains

This research focuses specifically on relationship quality and supplier performance in agri-food supply chains. For example, Krause and Ellram (2014) assert that it is important to focus on relationships within specific industries in order to better understand the relational dynamics in strategic buyer–supplier relationships. Furthermore, Grimm, Hofstetter, and Sarkis (2014) argue that in comparison to other industries, the agri-food industry has some unique characteristics resulting from the production and distribution of vegetable- and

animal-based products (Haasis & Ldic, 2008). For example, Van der Vorst, Van Dongen, Nouguier, and Hilhorst (2002, p. 124) list a number of unique product issues, such as "shelf life constraints, variable quality and quantity in the supply of farm-based inputs due to biological variations, seasonality, random factors connected with weather and pests and other biological hazards". These factors create inelasticity in supply, and they significantly increase the uncertainty in the supply chain, which can impact on buyer-seller relationships. Furthermore, food supply chains typically comprise a wide variety of different participants, such as retailers, wholesalers/distributors, various traders, processors, marketers/storage, farmers and farm suppliers (Roth et al., 2008). There is also, frequently, a large and fragmented supply base (Haasis & Ldic, 2008). This makes managing supplier relationships more costly and complex. Further complexity is created because food safety and environmental sustainability are important concerns for both stakeholders and consumers. These issues then drive regulatory requirements for environmental management and traceability in all stages of production, processing and distribution (Grimm et al., 2014).

Agricultural production also has significant geographical constraints relating to soil, climate and land availability. Such factors mean that production is often spread over a large geographical area and can frequently be some distance from consumer markets. These physical constraints results in product distribution over large physical distances often requiring controlled atmosphere transportation (Grimm et al., 2014). Another feature is the inaccuracy of visual assessment of quality. Frequently, eating quality can only be assessed through the destructive testing of the product, which means that quality testing each item is not feasible (Roth, Tsay, Pullman, & Gray, 2008). Consequently, buyers may safeguard quality by investing in long- term relationships with trustworthy suppliers rather than focusing solely on price through transactional relationships (Grimm et al., 2014; Roth et al., 2008). These issues also give rise to the potential for opportunistic behaviour. Suppliers and buyers may take advantage of their position by providing incomplete or incorrect information to achieve a self-interested gain (Ziggers & Trienekens, 1999). All these factors highlight the complexity and difficulty of managing farmer suppliers. This situation is compounded by the lack of published research on buyer-supplier relationships in the agri-food industry. All this emphasises the importance of buyer-supplier relationship management and the need for further research to address some of the knowledge gaps in this area.

1.3.1 Competitive advantage in the New Zealand agri-food sector

The New Zealand agri-food sector faces significant challenges to maintain its competitive advantage which has important implications for supplier relationships and performance. The New Zealand agri-food industry has focused on improving productivity and efficiency to preserve its position as one of the world's most efficient agricultural producers. However, this strategy is becoming more difficult to maintain with rising land and production costs (Figure 1-2) as well as regulatory and environmental constraints on agricultural intensification.

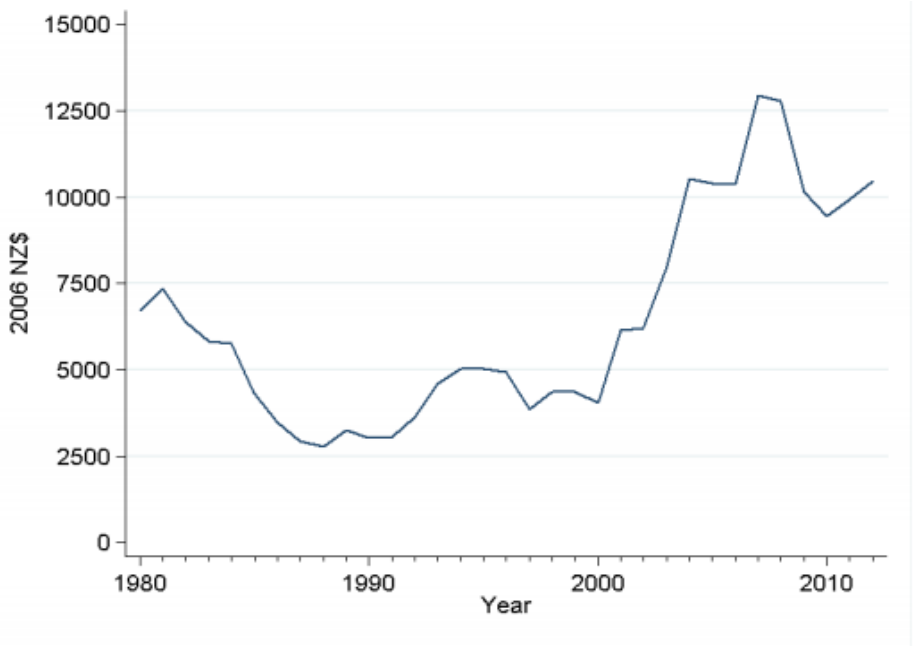

Figure 1-2: National average real price per hectare of New Zealand rural land 1980 - 2010

Source: (Allan & Kerr, 2014)

As a result, many New Zealand exporters have invested in increasing product value through differentiation (Porter, 1985), requiring a greater emphasis on delivering products that meet the needs of selected high-value consumers. These consumers require a year-round supply of high-quality, safe food. Also, they demand food that aligns with their personal values. These demands include credence attributes such as environmental sustainability, animal welfare and fair trade, as well as local and organic production (Grunert, 2005; Saunders, Guenther, Tait, & Saunders, 2013).

Meeting these requirements is difficult within the constraints of New Zealand's pasture-based agricultural production system and the traditional transactional relationships with suppliers. It requires farmer suppliers who have the ability and motivation to meet these higher specifications. It also requires a significant change in the relationships in the supply chain, in particular, between the farmer suppliers and the processors (buyers). For example,

the New Zealand red meat sector has traditionally relied on short-term spot market exchange relationships between farmer suppliers and buyer-processors (McLeod, Mair, Parker, & Belworthy, 2011). While these type of relationships may be efficient for large volumes of undifferentiated products they are less effective in meeting consumer needs for differentiated products (Sonka, 2003).

In a spot market transaction, there is little information flow between the buyer and seller and one supplier can be easily substituted for another. In contrast, long-term collaborative relationships enable a greater flow of information through the supply chain. Information transfer is necessary with differentiated products where credence[1] quality attributes valued by consumers are not visible in the physical product at the point of purchase, or even after consumption (Dyer & Singh, 1998; Nelson, 1970). High levels of information flow mean consumer requirements can be communicated up the supply chain to producers as well as product attributes being communicated down the supply chain to consumers (Figure 1-3). Without this information flow credence attributes, such as country of origin, often get filtered out in the supply chain (Lees & Saunders, 2015). The importance of communication can be seen with New Zealand's beef and dairy exports where the majority are exported as unbranded commodities . Spot market relationships also often mean there is little information flow from consumers back to producers. Information flow between buyers and sellers is a critical factor in promoting closer relationships and improving buyer and supplier performance (Paulraj, Lado, & Chen, 2008). With trusting relationships there can be improved communication and therefore a better match of supply and demand; farmers can adapt the timing of their supply and product specifications to consumer demand (Lees & Nuthall, 2014).

[1] Credence attributes are those believed by a consumer to be present in a product even though they are not directly observed at time of purchase or on consuming the product. Examples include food safety, animal welfare, environmental protection and cultural authenticity.

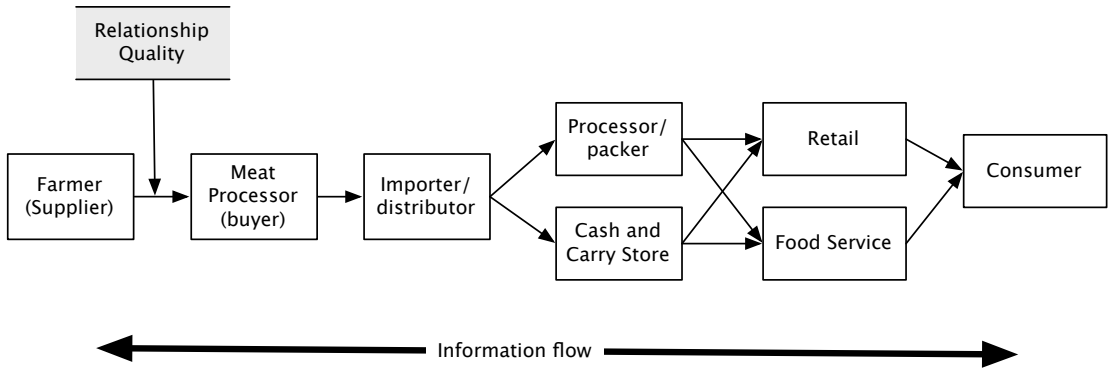

Figure 1-3: Information flow and relationship quality in the New Zealand red meat supply chain

There is also a need to improve supplier performance. Suppliers need to have the ability and commitment to meet higher product specifications, while working with less flexible delivery schedules. Improved supplier relationships and performance would mean moving from a competitive model to a partnership model with improved relationship quality (Dwyer, Schurr, & Oh, 1987; Jae-Nam & Young-Gul, 1999; Srinivasan, Mukherjee, & Gaur, 2011). This shift involves relationships based on mutual trust, openness, and where the responsibility, authority and decision making are shared more evenly. It is important for the New Zealand agri-food sector to address these issues in order to maintain a competitive advantage.

1.4 Buyer-supplier relationships in New Zealand red meat supply chains

This research focuses on processor-supplier relationships in the New Zealand red meat sector. These relationships are important as agriculture, including the red meat industry is a significant part of the New Zealand economy. While agriculture is responsible for only 4.1% of New Zealand's GDP (Index Mundi, 2016), it accounts for 70% of merchandise exports (Ministry of Primary Industries, 2016). The red meat sector is second only to dairy in terms of the value of exports. In 2016, it represented 11.9% of total exports (The Treasury, 2016). New Zealand still relies on a small number of key markets for its agricultural exports, despite significant diversification (Table 1-1). This lack of market diversification makes New Zealand vulnerable to political changes and increased trade barriers.

Table 1-1: Proportion of NZ main agricultural products exported

Product	Per cent exported	Main market	Per cent to main Market 2015
Dairy products	97 per cent	China	28 per cent
Sheep meat	90 per cent	European Union	52 per cent
Beef	80 per cent	USA	45 per cent
Venison	90 per cent	European Union	78 per cent

Source:(Statistics New Zealand, 2013)

As well as the importance to the New Zealand economy the red meat industry was chosen because it has particular characteristics that add to the difficulty of managing buyer-supplier relationships. Red meat production in New Zealand is primarily produced on un-irrigated pastures with little use of supplements. This production system enables low-cost, year-round outdoor grazing that produces natural, high-quality meat products. However, it also means that production is highly seasonal with significant variations due to the climate (Bensemann, Shadbolt, & Conforte, 2011; McLeod et al., 2011). Changes in pasture supply, driven by variations in temperature and rainfall, play an major role in supply chain dynamics affecting price, quality and timing of supply (Bensemann et al., 2011). These challenges are compounded by seasonal and structural overcapacity in the processing[2] sector. Processing overcapacity has been caused by falling stock numbers and has resulted in a highly competitive procurement environment. Furthermore, the red meat industry has a large number of processors that creates a diversity of supplier relationships providing the variation needed for the research.

The problems with relationship quality and supplier performance in the New Zealand red meat industry have been known for some time. As recently as 2014, a review by a leading New Zealand bank commented that the, "Red meat industry lacks collaboration, and this shows up in the relationship between breeders and finishers, farmers and meat processors and (downstream) between meat traders and buyers in offshore markets" (ANZ, 2014, p. 10). Another report by McLeod et al. (2011) identified that the sector was dominated by commodity supply chains as opposed to differentiated value chains. They also indicated that to address the industry's problems there needed to be greater trust between processors and suppliers as well as incentives so that one part of the supply chain did not profit at the expense of the other.

There is, however, little research on relationship quality in the red meat supply chains. Furthermore, what little research there is does not address the issue of the effect of improvements in relationship quality on supplier performance from the buyer's perspective[3]. Supplier performance from the processors' perspective involves delivering the right quality and quantity of stock when required as well as being loyal to the buyer. Processors also want suppliers who will communicate effectively, and be financially viable

[2] New Zealand sheep numbers peaked in 1982, with a total of 70.3 million sheep this had fallen to 29.5 million in 2015. This resulted in significant overcapacity in meat processing plants.

[3] Supplier performance is defined from perspective of the buyer-processor. This is how the buyer processor would rate a supplier's performance in terms of how it adds value to their business and their customers.

and, therefore, sustainable in the long term. To achieve these goals, processors must be able to identify and select farmers who will successfully participate in customer-focused supply chains through meeting higher product specifications and delivery schedules required by consumers. They also want high levels of commitment as this means suppliers are willing to adapt to meet the required product specifications. Furthermore, committed suppliers will make relationship-specific investments and exert effort to satisfy the buyer (Buxton & Tait, 2012). Long-term, sustainable partnerships are characterised by high levels of trust, commitment, transparency and integrity and require a high level of collaboration between all parties (Kwon & Suh, 2004). These are also important factors in enabling the efficient and effective flow of information and allocation of resources in a supply chain (Buxton & Tait, 2012). Consequently, collaborative supply chain relationships reduce risk by mitigating against opportunism. These factors mean that it is important for the New Zealand agri-food industry to understand how to develop closer relationships with suppliers, and how to improve their performance.

1.4.1 Research objectives

The objective of the research is to investigate how buyers can improve relationship quality and supplier performance. Specifically, this research aims to understand how supplier characteristics and relationship attributes, as well as relationship quality influence supplier performance (Figure 1-4). From a theoretical perspective, this study aims to improve the understanding of relationship quality and supplier performance by integrating theories on buyer-supplier relationships from the economic, managerial and sociological disciplines. This research also intends to develop greater clarity in defining and measuring the dimensions of relationship quality. It will also address the issues regarding the lack of consensus or consistency in the theoretical approaches to research on buyer-seller relationships. Figure 1-4 represents a broad research framework. It identifies relationship characteristics and supplier characteristics as significant antecedents to relationship quality and supplier performance. Furthermore, it hypothesises that relationship quality is a key meditating variable in this relationship.

1.4.2 Research questions

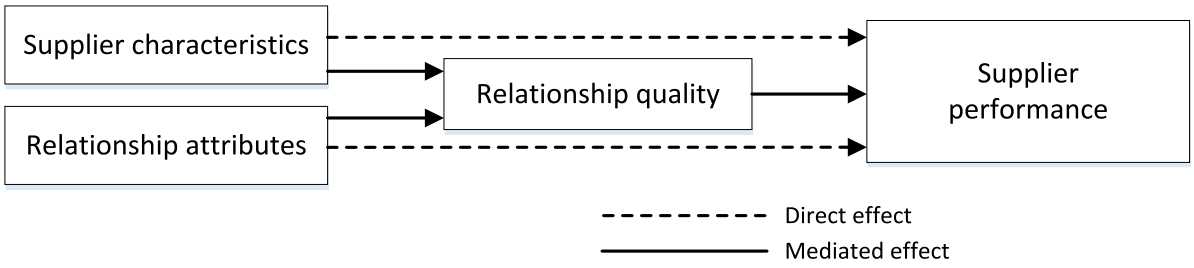

Figure 1-4: Conceptual framework for research questions

This conceptual framework raises significant research questions that are relevant to theorists as well as practitioners. These are:

1) How is relationship quality conceptualised and how can it be measured?
2) What are the antecedents to relationship quality?
3) Are there specific supplier characteristics and relationship attributes that affect supplier performance and how does relationship quality mediate these relationships?
4) How does improving relationship quality affect supplier performance?
5) How can processors influence supplier performance?

Understanding how to improve relationship quality and supplier performance will support suppliers and processors who are trying to move away from spot market relationships by providing an understanding of how to develop long-term partnerships.

1.4.3 Supplier perspective

The focus of the research involved measuring the suppliers' perception of their performance and relationship with the processor. As a result the quantitative research did not evaluate the processors perspective on these variables. The buyer perspective was included only in the qualitative. There were several reasons for this approach:

firstly, the research sought to identify ways that a processor may be able to influence supplier performance therefore it was important to understand how suppliers perceived their performance,

secondly measuring only the supplier's perspective provided consistency across all measures. It is also doubtful that the processor would necessarily have a more accurate evaluation of supplier performance as a result of the large number of producers supplying

relatively few processors. This is certainly the case for the supplier profitability variable. The research did however include the buyer's perspective in the qualitative phase of the research. The supplier performance items were developed from the literature and refined from interviews with the buyers.

Thirdly, from a methodological perspective, there is good evidence that self-rating provides valid measures of performance. Research has shown that though the absolute values may differ the causal relationships are the same (Whipple, Wiedmer, & Boyer, 2015). This was relevant as the model was identifying relationships rather than trying to generalise to a population. There are also a number of studies that use self-rating of performance to measure supplier performance (Kee-Hung, Cheng, & Yeung, 2005; Lockamy III & McCormack, 2004; Srinivasan, Mukherjee, & Gaur). Finally there is specific methodological literature showing that self-rating of performance can be an accurate method to evaluate performance (Farh, Werbel, & Bedeian, 1988; Lindeman, Sundvik, & Rouhiainen, 1995). Self-rating can also avoid potential processor biases that can affect the data (Kahneman, 2011).

1.4.4 Contribution of this research

This research aims to add to the overall understanding of the management of buyer-supplier relationships by addressing theoretical and conceptual issues that recent authors have highlighted. Furthermore, by focusing specifically on buyer-supplier relationships in agri-food supply chains, this study contributes to understanding the unique aspects of managing the relationships in an industry with a large number of geographically-dispersed suppliers, highly variable production systems and complex product characteristics associated with plant and animal based foods. From a practical perspective, this study will provide practitioners with tools to improve the quality of their relationships and the performance of their suppliers. It will provide them with a greater understanding of how to select suppliers who have the potential to be high-quality long-term suppliers. This study could not identify any previous literature that had simultaneously studied supplier characteristics and relationship attributes, relationship quality and supplier performance in agri-food supplies chains.

1.5 Organisation of the thesis

Chapter one presents the context of the research issues. Then there is an explanation as to why it is important to address the context of the New Zealand red meat sector. Included in this chapter are the objectives of the research, the research framework and the contribution of the study. In chapter two relevant literature in the field of exchange relationships is

reviewed. This discusses the commonalities and differences in the different theoretical approaches and attempts to develop a common frame of reference. From this the framework for the study is established and the constructs to be used in the empirical research are identified. Chapter three provides a review of the concept of relationship quality and the historical development of the construct. It also looks at how relationship quality is conceptualised in recent research and how it is related to social capital. Chapter four develops the theoretical framework and the hypotheses to be tested. Chapter five defines the constructs that emerged from the theoretical model and the literature. These are used for developing the scale measures. Chapter Six includes a description of the research design and the methodology utilised in the data analysis. It also focuses on the data preparation and the tests used to ensure the validity and suitability of the data for analysis. Chapter seven contains the exploratory factor analysis which tests the validity of the scale items. Chapter eight tests the validity of the scale items and latent constructs by applying a confirmatory factor analysis. Chapter nine aims to clarify the conceptualisation and measurement of relationship quality. This chapter also includes the SEM that explores the antecedents of relationship quality and supplier performance. This uses the results from chapter seven and chapter eight to identify the significant relationships between each of the supplier and relationship variables, relationship quality and the supplier performance variables. Chapter ten evaluates the supplier characteristics and relationship attributes and how they influence supplier performance variable. Chapter 11 identifies the antecedents of each of the supplier performance variables. This enables a picture of the antecedents for each of the supplier performance variables to be determined. Finally, in chapter 12 an in-depth analysis and discussion of the results are given. This is followed by the theoretical and managerial implication of the research and the limitations of the study as well as comments on the directions for future research.

Chapter 2: Literature review

2.1 Introduction

The study of relationship quality and supplier performance sits within the broader context of buyer-seller exchange relationships. This chapter provides an overview of the literature covering the key paradigms and theories that contribute to the current knowledge of exchange relationships. It identifies that in the context of buyer-supplier relationships there is no unified theoretical approach to inter-firm exchange relationships. Researchers typically draw on a wide range of theories to capture the complexity of exchange relationships. This leads to a discussion of the different perspectives from the economic and behavioural paradigms and how these can produce complimentary views on exchange relationships. Finally, there is an explanation of how these different perspectives can be synthesised into a multi-theoretical view that can produce greater understanding than any single interpretation. Therefore, the literature review provides evidence that many constructs are in fact common to a variety of theories.

2.2 Literature on exchange relationships

The task of identifying a common theoretical framework for exchange relationship is complicated due to the diversity of approaches in the literature. For example, Stern and Reve (1980) describe the literature on distribution channels as a “disjointed collage”, they state this is, “due, in part, to the absence of a framework which can accommodate the various paradigms and orientations employed” (Stern & Reve, 1980, p. 52). This sentiment has also been echoed by more recent authors in reference to the fields of exchange relationships and supply chain management (Hald, Cordón, & Vollmann, 2009; Halldorsson, Kotzab, Mikkola, & Skjøtt-Larsen, 2007; Ireland & Webb, 2007; Leonidou, Palihawadana, & Theodosiou, 2006; Ulaga & Eggert, 2005). In the view of these authors, the phenomena of inter-firm exchange relationships do not sit within any particular academic discipline but draw on a range of concepts derived from management, economics, psychology and sociology. Moreover, exchange relationships feature in diverse bodies of literature, such as channel marketing, neoclassical and institutional economics, classical and relational contracting, social exchange, supply chain management as well as organisational and strategic management (Croom, Romano, & Giannakis, 2000; Hunt, 1983; Stern & Reve, 1980). This has led to a wide range of definitions and theoretical concepts being applied to exchange relationships. In response to this situation the relevant literature is reviewed to

establish the theoretical foundation of the research. The review takes the form of a meta-synthesis which is consistent with the position of Tranfield and Starkey (1998, p. 352) who state that management research is, "transdisciplinary and, as such, cannot be reduced to any sum of parts framed in terms of contributions to associated disciplines (Tranfield & Starkey, 1998, p. 353) .

2.3 The role of theory and paradigms

The multidisciplinary approach to reviewing the literature requires an understanding of the role of theory and paradigms. Kuhn (1970) states that a paradigm includes a number of specific theories that depend on the fundamental beliefs and assumptions of the particular scientific community to which they belong. These include symbolic generalisations and shared values or criteria for use in theory appraisal. These represent the way of thinking of a discipline (Anderson, 1983; Gioia & Pitre, 1990). The paradigm is, therefore, the overarching perspective from which theories are established. Theory, on the other hand, provides a more detailed picture that can be used to explain and predict specific phenomena. Gioia and Pitre (1990), for example, define a theory as a, "coherent description or explanation of observed or experienced phenomena" (Gioia & Pitre, 1990, p. 587). This is consistent with the general understanding of theory as a meaningful system of related concepts and observations, from which are derived laws, propositions and hypotheses. (Bagozzi & Phillips, 1982; Hunt, 1983; Zaltman, Pinson, & Angelmar, 1973).

What constitutes an accepted theory, however, is often dependent on the particular dominant paradigms of a scientific discipline. It is important, therefore, to make explicit the underlying assumptions and methodology of the research approach. This research uses the abductive approach of Harman (1965, p. 88) who proposes that theory acceptance should be based on the "inference to the best explanation". This means a theory is accepted if it is the best theory available to explain and predict the phenomena in the theory's domain[4]. An accepted theory, therefore, will be the one most appropriate for guiding actions or interventions. In this way, theories are also evaluated for their ability to address specific problems. As Popper (1963, p. 67) states, scientists are "not students of subject matter but students of problems. Problems may cut right across the borders of any subject matter or discipline". This practical problem-solving approach is also in line with the assertion of Lewin

[4] Kuhn argues that an accepted theory is only accepted until a new and better theory with greater explanatory power comes along.

(1951, p. 169) that, “there is nothing as practical as a good theory”. Good theory therefore, should also attempt to minimise complexity as this adds to understanding. This is further explained by Kahneman (2011, p. 287) who states that in “science complexity is considered a cost, which must be justified by a sufficiently rich set of new and interesting predictions of facts that existing theory cannot explain”. Scientists, holding to Kahneman’s view, use theories as a bag of tools, and they will “not take on the burden of a heavier bag unless the new tools are very useful” (Kahneman, 2011, p. 288). These principles were adopted as a fundamental approach to the research and, in particular, the literature review.

2.4 The concept of exchange relationships and the theory of rational choice

Buyer-seller exchange relationships are a fundamental concept in economics, marketing and sociology. In economics, exchange relationships were initially described by using the concepts of the division of labour, gains from trade and comparative advantage. Adam Smith in 1776 asserted the self-evident benefits of exchange when he declared “the aim of every prudent master of a family, is never to attempt to make at home what it will cost him more to make than to buy”. These benefits were further developed in 1817 by David Ricardo using the principle of comparative advantage. When different producers (or countries) can produce different goods with a lower relative opportunity cost (lower relative marginal cost), then all parties benefit from the exchange, even if one party has an absolute advantage in producing all goods (Ricardo, 1817). These two key economic principles explain how, through specialisation and exchanging goods, both parties in an exchange relationship can be better off.

Exchange relationships have become a central concept in a number of disciplines such as marketing and supply chain management. It is also important in the utilitarian perspective[5] of sociology which sees human interaction primarily as an exchange process. In this view, when people interact they seek to maximise the benefits they gain from the interaction and to reduce the disadvantages (Collins & Collins, 1994). A key underlying tenet of neo-classical economics, marketing and utilitarian sociology is rational choice theory (Scott, 2000). Rational choice theory uses a specific definition of “rationality” which proposes that an individual balances the costs and benefit of actions and makes a choice based on maximising or optimising personal advantage (Friedman, 1953). This assumption creates the important

[5] Within sociology utilitarianism is commonly called exchange theory or rational choice theory

distinction between the economic and behavioural paradigms in inter-firm exchange relationships. These will be discussed in the next section.

2.5 Economic and behavioural paradigms

This review classifies theories relating to the nature and function of inter-firm exchange relationships that have developed from the economic and behavioural paradigms (Stern & Reve, 1980). These two paradigms have significantly different assumptions (Table 2-1) and therefore have a substantial impact on the way exchange relationships are understood.

Table 2-1: Comparison of the assumptions between the behavioural and economic paradigms

	Economic "rational decision" making assumptions	**Behavioural decision-making assumptions**
Decision making assumptions	Global rationality, maximisation and optimisation, full knowledge of preferences, alternatives and outcomes	Bounded rationality, incomplete and inaccurate knowledge about preferences and the consequences of actions
View of the firm	Single central decision maker	Multiple individual and coalitions of decision makers with different goals

Behavioural theory was first explained in the writings of Cyert and March (1963), March and Simon (1958) and Simon (1955), it has a distinct view of the firm and rational decision making. The behavioural model is, essentially, "a reaction against the neoclassical model of economic theory" (Anderson, 1982, p. 18). It has a fundamentally different view of rationality (Table 2-1). The concept of rationality in neoclassical theory is described as "global rationality", "maximisation", "optimisation" as well as "perfect rationality" (Barros, 2010, p. 457). It "assumes that the decision maker has a comprehensive, consistent utility function[6], knows all the alternatives that are available for choice, can compute the expected value of utility associated with each alternative, and chooses the alternative that maximises expected utility" (Simon, Dematte, & Raffaele Mattioli, 1997, p. 17). In contrast to this, the behavioural approach adopts the more realistic assumption of "bounded rationality" (Simon, 1957, p. 198). This position is based on observation of actual human behaviour. It assumes that the decision maker must search for alternatives, and has incomplete and inaccurate knowledge about the consequences of actions (Table 2-1). They therefore, choose actions that are satisfactory rather than maximising. The objective is to attain some realistic target while satisfying certain constraints (Simon et al., 1997). This model of decision making (Simon, 1955, p. 114) is called "approximate rationality", which includes the concept of

[6] A mathematical function which ranks alternatives according to their utility to an individual.

satisficing[7], where decision makers evaluate the options sequentially and choose satisfactory alternatives based on some aspirational level or optimal outcome.

Furthermore, the behavioural perspective also has a distinct view of the firm (Table 2-1). It sees the firm as a "coalition of individuals" (Anderson, 1982, p. 18). These coalitions are what would now be called stakeholders (Brenner & Cochran, 1993) and includes: "Managers, workers, stockholders, suppliers, customers, lawyers, tax collectors, regulatory agencies, etc. " (Cyert & March, 1963, p. 27). This is an important distinction, as the organisation no longer has a central decision-maker[8] who has a singular goal that can be maximised through rational decision-making. Furthermore, different stakeholders may wish the organisation to pursue divergent goals. These cannot be reduced to some common dimension that can produce an optimised solution (Anderson, 1982). In the view of Cyert and March (1963, p. 117), goals are viewed as: "A series of independent aspiration-level constraints imposed on the organisation by the members of the organisational coalition".

Anderson (1982) argues that these two approaches come from two distinctly different research traditions. The economic approach is grounded in deductive instrumentalism[9] (Figure 2-1). In this approach, the ultimate test of a theory is its ability to generate useful predictions, and the reality of its assumptions are unrelated to its validity (Popper, 1963). This is exemplified in the positive economics of Friedman (1953) who asserts that: "Truly important and significant hypotheses will be found to have 'assumptions' that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions (in this sense)" (p. 14).

The behavioural approach, in contrast, is grounded in what is known as inductive realism[10] where theoretical constructs are at least "approximately true" to the real world (Hunt, 2011, p. 159). Inductive methodology is used for developing theory, and this involves observation (Anderson, 1982; Cyert & March, 1963). This divergence of fundamental research paradigms identifies the difficulties in developing a common theoretical approach to exchange

[7] Satisficing is the conception of diverse decision procedures. The decision maker does not have to take into account all possible behaviour alternatives. Alternatives can be sequentially found out, by search processes, search being interrupted when a satisfactory alternative is found (De Jong & Nooteboom, 2000).

[8] The neoclassical economic decision making is vested in an owner-entrepreneur whose sole objective is to maximise the dollar amount of the firm's single period profit (De Jong & Nooteboom, 2000).

[9] Instrumentalism: the conception that the significant factor of a thing is its value as an instrument. The doctrine that ideas [theories] are instruments of action and that their usefulness determines their truth (Barros, 2010).

[10] Realism: Assumption that the world has a definite and mind-independent structure.

relationships. To address this, the research adopts a meta-synthesis approach that will attempt to develop a common theoretical perspective.

2.6 Multiple paradigms and meta-synthesis approach

This section explains how the literature on supplier-buyer relationships was evaluated and outlines how the divergent behavioural and economic paradigms can be synthesised into a common framework. The validity of this approach is supported in existing literature for example, Stern and Reve (1980) propose that there is value in both paradigms. They suggest that the economic and behavioural paradigms should be viewed as complementary "because the former deals mainly with economic outputs while the latter is concerned with behavioural processes" (p. 53). Furthermore, Rudner (1966) states that theory should increase understanding through a structure that is capable of both explaining (behavioural) and predicting (economic) phenomena. These differences can be seen as a strength, for example, Gioia and Pitre (1990) contend that a multi-paradigm approach has the potential to generate more complete knowledge than any single perspective.

To achieve this objective a meta-synthesis approach to the literature review was adopted (Bair, 1999; Walsh & Downe, 2005). This was combined with the meta-paradigm theory building approach described by Gioia and Pitre (1990) and Lewis and Grimes (1999). In this process, differences are not glossed over as these become opportunities for new understandings and perspectives and reflect the "tension between contradictory and alternative explanations". This process enables a richer, more holistic and contextualised view of supplier- buyer exchange relationships (Lewis & Grimes, 1999).

2.7 Theoretical perspectives on exchange relationships

The following section looks at some of the attempts in the literature to build a multi-theoretical approach to supplier-buyer exchange relationship originating from both the behavioural and economic paradigms. Exchange relationships are complex socio-economic phenomena and the concepts cut across the physical, functional and legal boundaries of organisations (Giannakis & Croom, 2004). This results in difficulties in defining these concepts and also explains the lack of a singular theoretical framework for explaining the nature and functions of these relationships.

Within the supply chain management literature there are some studies that attempt to use a multi-theoretical approach. For example, Halldorsson et al. (2007) presented four different theoretical approaches to managing supply chains, but also comment that there is no unified

theory of supply chain management. The theories used by Halldorsson et al. (2007) are: principle agent theory (PAT), transaction cost economics (TCE), network theory (NT) and the resource-based view (RBV).

In another study, Wulf and Odekerken-Schröder (2001) analyse seven theories applying to underlying relationships between retailers and customers in marketing channel research. These theories are: neoclassical economic theory (NET), transaction cost economics (TCE), relational contract theory (RCT), social exchange theory (SET), equity theory (ET), political economy theory (PET) and resource dependency theory (RDP). Furthermore, in the context of research on exporter-importer relationships quality Leonidou et al. (2014) note that a wide range of theoretical perspectives have been used. The most frequent are transaction cost economics (TCE), resource dependency theory (RDT), the behavioural paradigm of Cyert and March (1963) and network theory (NT).

Ulaga and Eggert (2005) describe a rich and growing body of research focusing on buyer-supplier relationships that draw on variety of approaches and disciplines. Examples of these include: social exchange theory (Anderson & Narus, 1984), transaction cost analysis (Anderson & Weitz, 1992; Rindfleisch & Heide, 1997; Williamson, 1985) relational contracting (Lusch & Brown, 1996), the literature on power and dependence (Frazier, 1983; Hunt, Ray, & Van Wood, 1985; Stern & Reve, 1980), and the resource-based view of the firm (Barney, 1991; Hogan & Armstrong, 2001; Jap, 2001; Srivastava, Shervani, & Fahey, 1999; Srivastava, Fahey, & Christensen, 2001; Srivastava, Shervani, & Fahey, 1998). This demonstrates that a multiplicity of theories have been used to explain exchange relationships. As a result, this literature review aims to consider the most commonly used of these, identify the commonalities and differences that can enable the development of some common constructs which can be used to evaluate relationship quality and supplier performance.

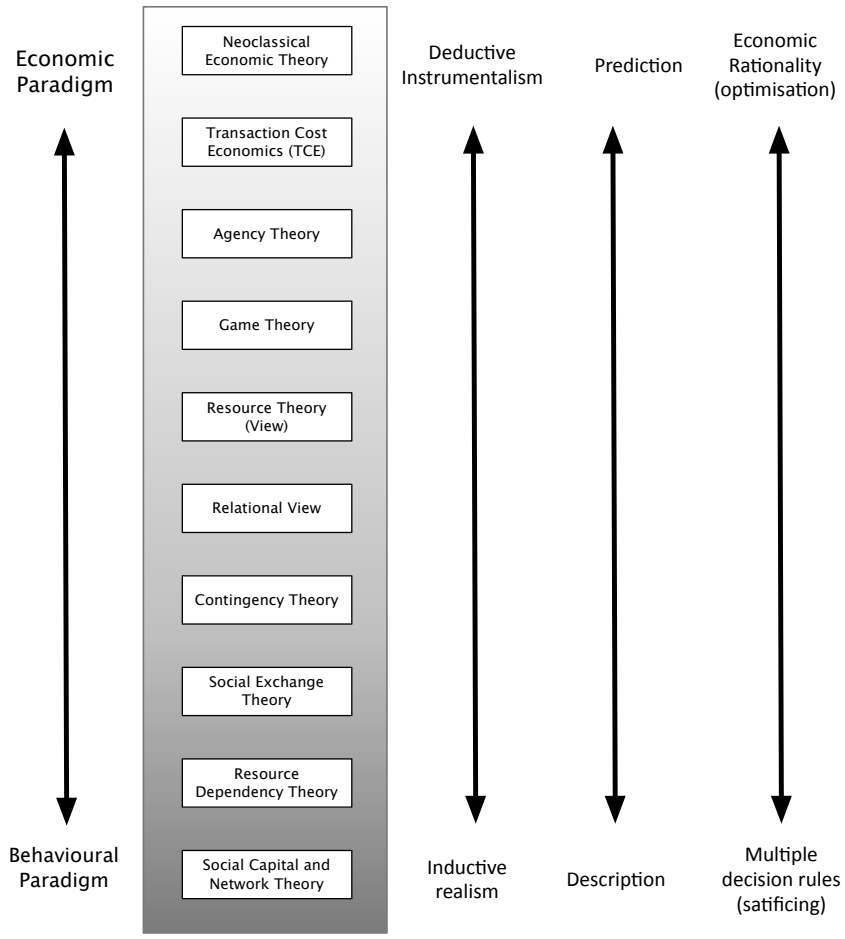

Figure 2-1: Exchange relationship theories and paradigms

Figure 2-1 provides a general classification of the different theories regarding their proximity to behavioural and economic paradigms. It should be noted that strict classification is difficult as sometimes the underlying assumptions are not made explicit, and many of these theories include a mixture of behavioural and economic assumptions. The neoclassical economic theory is the only approach that sits entirely within the economic paradigm. Transaction cost economics (TCE), Agency theory (AT) and game theory (GT) are closely aligned with the New Institutional economic paradigm and attempt to reflect real-world phenomena by including the behavioural assumption of bounded rationality. The other theories: resource theory (RT), the relational view (RV), contingency theory (CT), social exchange theory (SET), resource dependence theory (RDT), social capital theory (SCT) and network theory (NT) include more behavioural assumptions though to varying degrees still incorporate assumptions from the economic paradigm.

From these different perspectives, a wide range of exchange relationship concepts have been identified (Cannon & Perreault Jr, 1999). For example, trust and commitment have consistently been identified as central concepts in exchange relationships (Anderson & Weitz, 1992; Athanasopoulou, 2009; Day, Fawcett, Fawcett, & Magnan, 2013; Doney &

Cannon, 1997; Jain, Khalil, Johnston, & Cheng, 2013; Morgan & Hunt, 1994; Ulaga & Eggert, 2005). Other important concepts are power, environmental uncertainty and dependence (Belaya & Hanf, 2009; Casciaro & Piskorski, 2005; Cook & Emerson, 1978; Jain et al., 2013; Lusch & Ross, 1985; Maloni & Benton, 2000; Mohr, Fisher, & Nevin, 1996; Molm, Peterson, & Takahashi, 1999; Ogbonna & Wilkinson, 1998; Zhao, Huo, Flynn, & Yeung, 2008). These factors are seen to influence two behaviours that are central to exchange relationships, opportunism (Brown, Dev, & Lee, 2000; Hill, 1990; John, 1984; Wathne & Heide, 2000) and collaboration (Axelrod, 1984; Carpenter, Daniere, & Takahashi, 2004; Hua & Li, 2008; Laaksonen, Jarimo, & Kulmala, 2009; Rindfleisch, 2000; Skinner, Gassenheimer, & Kelley, 1992; Svensson, Mysen, & Payan, 2010).

The assertion is that for efficient exchange, partners should behave cooperatively and refrain from acting opportunistically. Therefore, there is an underlying assumption that cooperation will lead to improved performance (Noordewier, John, & Nevin, 1990). Table 2-2 identifies some of the important concepts found in the exchange relationship literature.

Table 2-2: List of exchange relationship concepts identified in the literature

Common exchange relationship concepts
Trust
Commitment
Opportunism
Collaboration
Power
Specific assets
Dependence
Environmental uncertainty

In the next section, the dominant theoretical perspectives on exchange relationships are reviewed. Their key assumptions and exchange relationship constructs are identified. Following this, the different views are then examined in terms of their effects on relationship quality and supplier performance.

2.8 Economic approaches to exchange relationships

This section reviews the main theories that take a predominantly economic perspective on supplier-buyer exchange relationships. Other than neoclassical economic theory, however, all the other approaches include some behavioural assumptions. These will be identified along with the economic assumptions and the constructs that are associated with this. This will enable the identification of common constructs that emerge from each theory.

2.8.1 Neoclassical economic theory

The fundamental focus of neoclassical economic theory is the market exchange mechanism. As mentioned above, economic concepts, to some degree, influence all the perspectives of exchange relationships. The term “neoclassical” first came into use in 1900 to refer to a synthesis based on the classical works of Adam Smith, David Ricardo and John S Mills (Colander, 2000; Veblen, 1900). Today, it is used to describe both the dominant economic theory from 1870 to the 1930s as well as modern economics in contrast to heterodox economics. (Colander, 2000; Tabaro, 2010; Weintraub, 1993).

The basic assumptions of neoclassical economics are that (Colander, 2000; Tabaro, 2010; Weintraub, 1993)

1. people have rational preferences among outcomes,
2. individuals maximise utility and firms maximise profits, and
3. people act independently on the basis of full and relevant information.

Exchange relationships from a pure neoclassical economics perspective involve only discrete transactions where all relevant exchange information is reflected in the market price, which is determined by the quantity supplied and customer demand (Webster, 1992). Furthermore, the neoclassical economic paradigm focuses on market equilibrium, with perfect competition providing ideal resource allocation (Arndt, 1983; Fischer, 2013). Performance is optimised under prefect competition as resources are allocated efficiently and products are delivered to consumers at least cost (Arndt, 1983; Fischer, 2013; Houston & Gassenheimer, 1987). As Webster (1992) explains, “The starting point of this analysis is a transaction between two economic actors in the competitive market place. Each transaction is, essentially, independent of all other transactions, guided solely by the price mechanism of the free, competitive market as the firm seeks to buy at the lowest available price” (p. 5).

The focus on competitive markets, and aggregate supply and demand means economic theory fails to account for non-market based exchange behaviours between two parties. This is despite the fact that most exchange relationships involve non-market transactions, where purchases over time are made with the same buyer or supplier (Webster, 1992). The assumptions of economics theory do not allow for long-term exchange relationships. Therefore, concepts like relationship quality or supplier performance are not relevant as all

exchanges are discrete [11], anonymous and suppliers are homogeneous. Furthermore, many of the other concepts of marketing and business, such as branding, product differentiation and interconnected supply chains, do not fit within the assumptions of neoclassical economic theory.

From this perspective, there is no need to consider people, relationships or social processes, as the units of analysis are products, prices, costs, firms and transactions (Webster, 1992). Significantly, when economic theory attempts to incorporate some of the imperfections of real world exchange relationships, it loses much of its power and elegance (Emerson, 1976). Therefore, neoclassical economics can only deal with aggregated exchange relationships with large numbers bargaining, high levels of competition, homogeneous products and where there is freely available market and product information. As a result, the economic model has difficulty in adding to an understanding of relationship quality and supplier performance due to its basic assumptions.

Bounded rationality

Because of these unrealistic assumptions neoclassical economics has been criticised as lacking real world explanatory power (Hunt & Morgan, 1995). From the perspective of business, marketing and supply chain management, individuals do not act independently, nor do they operate with full information, nor are they pure profit maximisers. Accepting this reality raises the issue of what to do if some of the assumptions of neoclassical economic theory are relaxed. For example, how can this theory deal with the introduction of the behavioural assumption of bounded rationality (Simon, 1955; Williamson, 1979)? Bounded rationality is a combination of insufficient information that limits the perception of management and limits the capacity for information processing. With bounded rationality comes the possibility that individuals will take advantage of asymmetric knowledge to behave opportunistically.

There have been a number of attempts to deal with these issues while also holding to some economic rationality assumptions. In the following theories, many assumptions such as perfect information, certainty, and profit maximising have been relaxed; however, the core paradigm of neoclassical economics remains (Arndt, 1983; John & Reve, 2010) The main

[11] Discrete exchange is a single one-off exchange with no repeats. As there are very few real-life exchanges that meet these criteria, economics attempts to incorporate long term exchanges simply by allowing for repeated exchange. However, the assumption of anonymous transactions and homogeneous suppliers means that these repeated exchanges cannot be seen as long-term relationships.

theories that adopt this approach are: the new institutional economic theories of transaction costs economics (NIE) (Coase, 1937; Williamson, 1979), agency theory (AT) (Carlos, 1992; Eisenhardt, 1989), game theory (GT) (Axelrod, 1984; Hill, 1990) and social exchange theory (SET) (Anderson & Narus, 1984; Emerson, 1976; Thibaut & Faucheux, 1965). In effect, new institutional economics (NIE) tries to address some of the assumptions of neoclassical economics that do not operate in the real world by incorporating some assumptions from the behavioural paradigm. Transaction cost economics theory (TCE) is one of the main attempts to achieve this by introducing bounded rationality and transaction costs.

2.8.2 Transaction cost economics

Transaction costs are a central concept to TCE. The concept originated with Coase (1937) to explain the existence of firms. He identified that specialist firms could allocate resources more efficiently and, therefore, create greater value than larger generalist businesses which affects whether firms choose to make or buy (Coase, 1937). Building on Coase's ideas, Williamson (1981, p. 1537) asserts that, "The modern corporation is mainly to be understood as the product of a series of organisational innovations that have had the purpose and effect of economising on transaction costs". In this way, Williamson uses transaction costs to identify why firms might try to avoid market exchange transactions.

Transaction cost economics incorporates the behavioural assumption of bounded rationality introduced by Simon (1955), as well incorporating the contingency theory (CT) approach of Thompson (1967). Both of these ideas were influenced by the work of Boulding (1956) who introduced the idea of general systems theory. In this view, organisations are open systems that manage and structure themselves to adapt to environmental circumstances (Davis & Cobb, 2010; Zeld & Scott, 2003). While transaction cost economics no longer has the neoclassical economic assumption of perfect information, it maintains its efficiency and perfect rationality assumptions, where a single decision maker within an organisation tries to maximise or optimise their outcomes (Barros, 2010). As emphasised by Ouchi (1980, p. 130), "The transactions cost approach explicitly regards efficiency as the fundamental element in determining the nature of organisations". Williamson defines transaction cost economics is an "interdisciplinary undertaking that joins economics with aspects of organisation theory and overlaps extensively with contract law" (Williamson, 1979, p. 261). Therefore, in the view of Williamson and other authors, "transaction cost theory is not in conflict with economic theory but complements it" .

The idea of transaction costs is that there are not only costs associated with the price paid, but also costs associated with the transaction itself. These are the "cost of using the price mechanism" (Coase, 1937, p. 390). Sako (1992) identifies six categories of transaction costs search costs (finding of a partner), negotiation costs (agreements about the deliveries), inventory costs (inventories caused by the product flows from the supplier to the customer), monitoring costs (observation of contracts), trust building costs (creation of mutual and proper trust and expectations), and adjustment costs (responding to the changing conditions).

Opportunism and exchange relationships in the transaction cost framework

The assumptions of TCE lead to a specific description of the type of exchange behaviours that occur. By assuming the self-interest and the profit maximising assumption of the economic paradigm with bounded rationality, all firms should behave opportunistically. Williamson (1975) defines this as "self-seeking with guile"(Williamson, 1975, p. 6). This classic definition of opportunism is central to TCE, and Williamson asserts that without this "the study of economic organisation is pointless" (Williamson, 1981, p. 1545). This idea of opportunism has significant implications for supplier-buyer relationships. The fundamental dilemma in these relationships is that different parties become dependent on each other. In a supply chain, for example, the supplier is dependent on the buyer for providing a market, and the buyer is dependent on the supplier for a product. In complex supply chains many parties may become interdependent. When there is asymmetrical information, there is a risk of opportunistic behaviour if parties are driven by self-interest, especially guileful self-interest.

According to transaction cost economics, opportunism can occur when parties become dependent. This can arise when the production or distribution of a product requires a transaction-specific asset. These transaction-specific assets are assets developed specifically for an exchange relationship and are of limited or no use for alternative relationships. Specific assets may be in physical assets, such as the location of plant and product and process technology (tools and equipment), as well as human resources involving specific knowledge and skills relevant to a specific exchange relationship (Fynes, Voss, & de Búrca, 2005; Humphreys, Li, & Chan, 2004). The dilemma from a supplier-buyer relationship perspective is that specific assets are important for productivity and efficiency, as improving these require investment in specialised physical and human assets. These specific assets have positive benefits by enabling firms to reduce production costs, meet customer

specifications and innovate and produce differentiated products (Poppo & Zenger, 1997). However, as these assets by definition have limited alternative uses and, as the parties have incomplete knowledge, there is potential for the dependent party to be taken advantage of. This is known as the hold-out problem. Therefore, risk and uncertainty increase in exchange relationships as specific assets decrease the number of potential alternative partners.

Williamson (1985) identifies three types of asset specificity: site specificity, physical asset specificity and human asset specificity (Dyer & Singh, 1998). The increase in these transaction-specific assets creates the problem of "small numbers bargaining". TCE introduces the idea of contracts as a way to reduce the risk of opportunistic behaviour, by specifying requirements and behaviour. However, TCE emphasises that it is impossible to create contracts that can deal with all potential outcomes, known as 'incomplete contracting' (Klein, Crawford, & Alchian, 1978). Therefore, as parties aim to reduce transaction costs involved in contracting and monitoring, there is a need for closer coordination. This involves a move away from market transaction to alternative governance arrangements, such as vertical integration. Therefore, TCE provides some explanation for why suppliers and buyers seek closer relationships through various forms of governance structures and identifies transaction costs as the reason for these closer relationships

Originally, transaction cost economics made no allowance for safeguarding transaction-specific investments other than with vertical integration (Robicheaux & Coleman, 1994). Initially Williamson did not have any intermediate forms between markets and hierarchies; however, he later introduced hybrid modes that involve long term contracts, reciprocal trading, regulation and franchising (Williamson, 1991). Ouchi (1980) identifies that both hierarchies and markets can be inefficient when there are very high levels of performance ambiguity. In this situation, relational governance mechanisms, such as hybrid organisations are more efficient. At this point, relational aspects are emphasised in TCE and are seen as hybrid forms of governance structure. The unique aspect of these hybrid organisations is that they develop common values and beliefs and can to function efficiently under high levels of performance ambiguity. Common values and beliefs provide a harmony of interests that reduce the risk of opportunistic behaviour (Ouchi, 1980). These relational exchanges develop familiarity, more efficient communication and develop both "institutional and personal trust" (Williamson, 1979, p. 240). In this way, transaction cost economics moves into the sphere of social relationships with a clear incorporation of assumptions from the behavioural paradigm. Although TCE acknowledges the existence of trust in supplier-buyer

relationships, the economic basis of TCE has, "difficulty explaining the formation and maintenance of trust[12]" (Ireland & Webb, 2007, p. 486). TCE also identifies basic social norms that are required for transactions to function; these are norms of reciprocity and norms of legitimate power (Williamson, 1979).

TCE to some degree addresses issues of power. It identifies power as the ability to influence firms to achieve economic gains, and that all exchange relationships will have one firm with a greater amount of power. Furthermore, if the weaker firm can create conditions whereby the more powerful firm will suffer significant costs from opportunistic behaviour it can then reduce the risk of the more powerful firm acting opportunistically (Ireland & Webb, 2007).

In summary, the TCE perspective explains that bounded rationality causes transaction costs to occur in buyer-seller relationships. This gives rise to the need to establish governance mechanisms to reduce opportunistic behaviour. Firms seek to maximise efficiency by reducing these costs through choosing market, hierarchy or hybrid forms of governance. Which of these types will be most efficient in operation will depend on human factors, such as goal alignment, the risk of opportunism, and environmental factors such as complexity and uncertainty. TCE is strongly grounded in the economic paradigm; however, it incorporates some significant assumptions from the behavioural paradigm. TCE explicitly deals with relationship quality and supplier performance through transaction costs and hybrid (relational) governance mechanisms. It is the difficulty in monitoring performance that contributes to transaction costs. This leads firms to move away from market transactions and to seek governance structures to minimise transactions costs. Therefore, in these, relationship quality factors such as trust, common goals and values and cooperation, become important. A similar but alternative approach to the issues of bounded rationality and opportunism is expressed through agency theory (AT).

2.8.3 Agency theory and reducing the risk of opportunism

AT also attempts to deal with the uncertainty introduced by bounded rationality in exchange relationships. It does this by focusing on different forms of contracts to ensure that the agent will act in the principal's best interest, rather than opportunistically. An agency relationship may be defined as a contract under which one or more persons, the principal(s), engage another person (the agent) to perform some service on their behalf, which involves

[12] Williamson defines trust between parties as "calculated risk" and not on personal trust between individuals.

delegating some decision making authority to the agent (Halldorsson et al., 2007). Agency problems arise because of asymmetric information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty and behaviour based on self-interest (Jensen & Meckling, 1976, p. 308). The types of contract mechanisms that can reduce the potential agency problems are defined as behaviour and outcome based contracts (Figure 2-2).

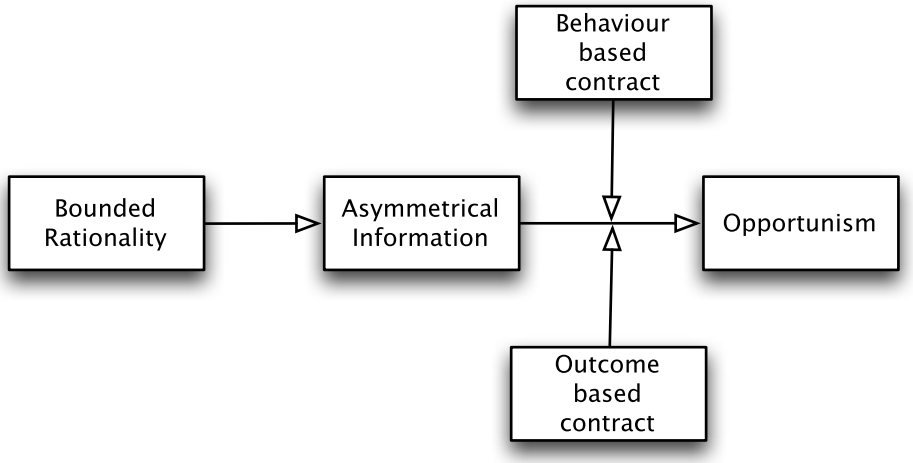

Figure 2-2: Behaviour-based and outcome-based contracts as moderators of opportunism
Adapted from Eisenhardt (1989)

Cooperation and opportunism in agency theory

The major focus of AT is to efficiently control opportunism in exchange relationships through contracts. Cooperation can occur by ensuring the agents' behaviour aligns with the principals' objectives. Behaviour-based contracts specify and monitor the agent's behaviour, and these contracts include, hierarchical governance and salaried employment with budgeting and reporting structures. These behaviour-based contracts reduce information asymmetry and enable the principal to specify the agent's behaviour, thereby, decreasing the possibility of opportunism. Outcome-based contracts, on the other hand, aim to provide incentives to the agent to align their interests with those of the principal, reducing potential for opportunistic behaviour and increasing transactional efficiency (Eisenhardt, 1989; Halldorsson et al., 2007). Examples of these include, stock options or commissions in employee compensation. These contracts transfer risk to the agent and, as a result, the agent may receive a low return no matter how much effort is expended (Lazzarini, Chaddad, & Cook, 2001).

The theory also identifies situations where these different types of contract will be more efficient. If the principal can easily verify the agent's behaviour, then behaviour-based contracts will be more efficient than an outcome-based contract. This is because AT views information as a cost. The principal is, therefore, faced with either the additional cost of measuring behaviour through information systems, or the cost of measuring outcomes and compensating the agent sufficiently for the transfer of risk[13]. If the principal cannot easily verify the agent's behaviour because of task ambiguity[14] (Anderson & Oliver, 1987), then problems of moral hazard and adverse selection arise. These are types of opportunistic behaviour. Moral hazard occurs when the agent does not put in the agreed effort, and the principal is unable to detect this (Eisenhardt, 1989, p. 58). Adverse selection arises, because the agent may misrepresent her/his skills and abilities and the principal cannot verify these before the agent is engaged (Eisenhardt, 1989). Where there is the potential moral hazard or adverse selection the principal can adopt either a behaviour-based or an outcome-based contract to mitigate this risk. The choice of contract type will, therefore, depend on the relative costs of information systems, monitoring for behaviour-based contracts, and measuring outcomes and compensating the agent for risk in outcome-based contracts. Outcome-based contacts operate in a more market like structure whereas behaviour-based contacts require some degree of hierarchy or integration. Tasks that are easy to specify in advance will also be less costly to monitor and, where there is difficulty in measuring outcomes, outcome-based contracts will be less attractive to both parties (Figure 2-3).

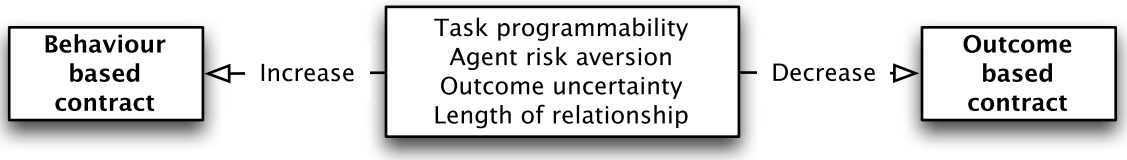

Figure 2-3: Factors affecting choice of contract type

Adapted from Eisenhardt (1989)

AT argues that measurement issues determine these contract governance mechanisms. For example, as with some agri-food products, there can be significant variation in how easily product quality can be verified. When product quality is difficult to measure, more behaviour-based contracts would be expected. Conversely, when quality is more easily verified incentives such as payments for different quality specifications are more likely.

[13] For example, the average commission-based remuneration will have to be higher than the average salary to compensate for the additional risk.

[14] Task ambiguity exist when there not a clear relationship between the performance of certain tasks and performance of the agent.

These might include psychological contracts, auditing, monitoring and third party audits (Eisenhardt, 1989). AT assumes a perfect market exists and, therefore, ignores issues of power and resource differences in supply chain relationships (Hornibrook & Fearne, 2001).

In reality, most exchange relationships incorporate both behaviour and outcome based governance. The “most efficient contract” includes the right mix of behavioural and outcome-based incentives to motivate the agent to act in the interests of the principal (Hornibrook & Fearne, 2001). In any relationship, there is a potential for the agent to expend some of the principal's resources on goals based on self-interest. Accordingly, it will pay the principal to provide the agent with incentives and to incur monitoring costs to encourage a convergence of interests between the objectives of the principal and those of the agent. Despite expenditures of this type, it will generally be impossible to ensure that all the agent's decisions will be designed to maximise the principal's welfare. The dollar value of the reduction in welfare experienced by the principal, along with the expenditure on monitoring activities, are the costs of the agency relationship (Hornibrook & Fearne, 2001).

2.8.4 Contributions and limitations of transaction cost economics and principal agent theory

Transaction cost economics is a highly influential theory in economics and is one of the predominant theories that explain a firm’s choice of governance mechanisms (Halldorsson et al., 2007). Therefore, it makes an important contribution to understanding aspects of relationship quality and supplier performance. It does have limitations, however, due to the embedded assumptions about human behaviour and the static view of the firm’s boundaries. There are also significant critiques of the theory and its empirical evidence. For example, transaction cost economics focuses on the costs associated with transactions but does not take into account the additional benefits that accrue to different types of governance mechanisms (Williamson, 2000). TCE also assumes that the parties to the transaction are risk neutral (Hornibrook & Fearne, 2001). This is necessary, as the TCE only looks at the characteristics of the transaction and not the characteristics of the parties involved.

Both Chiles and McMackin (1996) and De Jong and Nooteboom (2000) argue that TCE offers a limited perspective for analysing long-term exchange relationships and they propose that the theory should be extended. They also note that TCE has an incomplete view of the value each partner derives from the other. While it incorporates specific assets, it ignores the complementary resources that create value in long-term relationships. It focuses on the

reducing transaction costs and ignores the value derived from the learning and the development of competencies developed in a partnership. They also emphasise that TCE does not take into account how exchange relationships develop over time and the importance of trust in reducing transaction costs and increasing flexibility (De Jong & Nooteboom, 2000). Others question whether TCE prescribes what firms should do to survive, or is merely descriptive of behaviour (De Jong & Nooteboom, 2000).

Agency theory has also received considerable criticism. For example, Perrow (1986) faults agency theory for its lack of focus on the cooperative aspects of human interactions and highlights the fact that most people are not self-interested utility maximisers. This is further emphasised by authors such as Donaldson (1990) who move away from the assumptions of opportunism and conflict and focus on relationships involving cooperation and coordination. In a similar way to TCE it is the lack of congruence between the assumptions of AT and real human behaviour that is the main focus of the criticism (Fontrodona & Sison, 2006).

In summary, TCE and AT provide valuable insight into the reasons why different types of supplier-buyer relationship exist They also identify some important variables that are derived from these theories Table 2-3. However, TCE and AT offer only a limited view of these relationships. They see the primary goal of exchange relationships as minimising transaction/agency costs involved in managing the risks of opportunistic behaviour in supplier-buyer relations. They have a limited view of the value created through exchange relationships, especially those arising from the sharing of resources and the value derived from learning and developmental competencies (Chiles & McMackin, 1996). As a result, it is necessary to include other theories that can further explain the dynamics in governance structures and inter-organisational relationships. (Halldorsson et al., 2007).

Table 2-3: TCE and AT variables

Common variables
Specific assets
Governance mechanism
Environmental uncertainty
Transaction costs
Opportunism
Calculative trust
Dependence
Power

2.8.5 Game theory

Game theory (GT) also sits within the economic paradigm in terms of the individualistic, self-seeking, efficiency-maximising rules of rational choice theory. This theory is distinguished

from neoclassical economic theory by the assumption of interdependence (Axelrod & Hamilton, 1981; Esmaeili, Aryanezhad, & Zeephongsekul, 2009). This arises because the payoff or utility of any strategy depends on the strategy of the other player and, because of bounded rationality, it is not possible to know with certainty what this will be (McCartney, 2007). Although GT accepts bounded rationality regarding predicting behavioural outcomes of the exchange partner, it also accepts the rational choice assumptions that players know all the possible outcomes and all potential strategies and can choose an optimal solution. GT shares opportunistic behaviour, power and trust with transaction cost economics but can specifically analyse these concepts and establish conditions in which trust and cooperation will develop as opposed to opportunistic behaviour. This theory is, therefore, able to add to our knowledge of supplier-buyer relationships and supplier performance.

For example, Axelrod (1984) looks at how cooperation can become established by individuals acting with self-interest and without a central authority. A key focus of this theory is an analysis of the payoff to cooperation and defection (opportunistic behaviour) by two individuals. One such example is the well-known game, “The Prisoner’s Dilemma”(Axelrod, 1981). In this game, two players (prisoners) are accused of a major crime (they are guilty). They are each imprisoned and unable to communicate. The prisoners “dilemma” is that each must choose to cooperate or defect (behave opportunistically). Each must make the choice without the other knowing the opponent’s action. The authorities only have enough evidence to convict them of a minor crime without a full the confession of one of the accused. If both players cooperate and stay quiet they will both only get a minor sentence (mutual cooperation - MC). If only one party confesses then the one who confesses goes free (unilateral defection - UD) and the other party gets a severe sentence (suckers payoff - SP). If both confess then they both receive a moderate sentence (mutual defection - MD) - see Table 2-4.

Table 2-4: The prisoners' dilemma

		Player Y	
		Cooperate	Defect (act opportunistically)
Player X	Cooperate	R=3, R=3 Mutual cooperation	S=0, T=5 Unilateral defection
	Defect (act opportunistically)	T=5, S=0 Unilateral defection	P=1, P=1 Mutual defection

T= Temptation or reward for defecting
R= Reward for mutual cooperation
P= Punishment for mutual defection
S= Suckers payoff

By assumption:
T > R, so it pays to defect if the other player cooperates
P > S, so it pays to defect if the other player defects
R> (S+T)/2, To ensure that an even chance of exploitation or being exploited is not as good an outcome as mutual cooperation

Source: (Axelrod, 1981)

The dilemma is that if both defect (P=1) then they are both are less well off than if they cooperate (R=3). Despite this, in this simple game of the prisoners' dilemma, it always pays to defect (confess) whether you think the other will defect or cooperate. You will either go free or get a get a minor sentence. Therefore, this concludes that the natural state of things is for both parties to act opportunistically and shows that individual rationality leads to a worse outcome, and that opportunism is the natural state of being in supplier-buyer relationships. This is despite both parties knowing cooperation would make them better off. This is also the case if the game is played for a finite number of times[15]. Defection will be the dominant choice for self-interested individuals, and each will get less than they both could have recieved if they had cooperated. This dilemma relates to supplier-buyer relationships in that cooperation would bring greater rewards for both parties; however, the short-term incentive is not to cooperate.

Game theory and the emergence of cooperation

The value of game theory is its ability to offer insights into the possibility of cooperation emerging in supplier-buyer relationships. The theory emphasises that cooperation is only possible if the value of future payoffs is sufficiently large and the players know they will have an ongoing relationship. The long-term incentive for mutual cooperation must be greater

[15] In finite games there will always be a last move, therefore, the players knowing that it is the last game, will defect, because they anticipate this is the case on the last move they will also defect on the second to last move therefore, as long as the players know the games are finite they there will never be an incentive to cooperate (Douven, 2011).

than the short-term incentive for defection. Axelrod (1981) shows that if the players interact for an indefinite number of times, then cooperation can emerge because the reputation from previous encounters is carried over. For example, in supplier-buyer exchange relationships, business ethics are maintained by the knowledge that future interactions are likely to be affected by the outcome of the current exchange**.** This is known as the Iterated Prisoner's Dilemma (Wu & Axelrod, 1995). This involves a sequence of interactions where the payoff from future games is discounted, based on the standard economic assumption of that later consumption not being valued as much as earlier consumption. The greater the discount factor, the less important the future outcomes will be. Axelrod (1981) evaluated the outcomes of many different strategies. Using computer simulated tournaments, he showed that the highest average benefit score was attained by the simplest of all the strategies submitted, TIT for TAT. This strategy involves always cooperating and then defecting only after the other player defects. This shows that if one party is first to behave opportunistically then the other player will punish this. Furthermore, it was shown that if one player forgave the action then cooperation could be re-established and this improved the overall score. In multiplayer games, other players will also punish opportunistic behaviour. This result explains the natural sanctions that exist in business for opportunistic behaviour even though it may be in the short-term self-interest to do so. This demonstrates an important principle in supplier-buyer exchange relationships - reciprocity. This is that enlarging the shadow of the future and making the interactions more frequent or more durable can promote cooperation. It can also be promoted by changing the payoffs. Sanctions for opportunistic behaviour may be formal, or informal, laws or punishments for defection. This helps explain the mechanisms in TCE and AT where formal and informal governance mechanisms change the payoffs provide punishments for opportunistic behaviour and increase the benefits of long-term cooperation.

In summary, game theory offers significant insight into understanding buyer-seller exchange relationships. It uses many of the same variables as TCE and AT but can show the conditions under which cooperation and opportunism occur (Table 2-5). It can model long-term relationships through repeated exchanges and the effects of reputation. Game theory does not include a governance mechanism to manage opportunism and focuses almost entirely on the exchange and payoffs, and ignores the resources and capabilities each party brings to the exchange.

Table 2-5: Game theory variables

Common variables
Payoffs
Uncertainty
Opportunism
Cooperation
Dependence
Power
Trust

2.9 Organisational and resource theories

The economic approaches described in the previous section tend to focus on the nature of transactions. The nature of the organisations and the characteristics of the exchange parties themselves are secondary considerations. In contrast, the organisational and strategic management theories focus more on the organisation. In doing this, they focus on the characteristics of the exchange partners and their interaction with the external environment. Contingency theory focuses, specifically, on how the internal environment determines organisational performance, and how an organisation's structure fits with the external environment. The resource theories take this further and focus on the characteristics of the supplier-buyer exchange parties and how resources and capabilities can improve performance through greater competitive advantage. In this way, these theories offer important insights for this research about supplier's characteristics and performance as well as relationship quality. The focus on the exchange partners' characteristics enables an analysis of supplier characteristics as an antecedent to supplier relationship quality and performance. Furthermore, relationship quality is seen as a valuable relational resource that can provide competitive advantage to rivals.

2.9.1 Contingency theory

Contingency theory (CT) explicitly focuses on the effect of the external environment on the performance of the firm. In the 1960's, organisational theories moved from the closed systems of the bureaucratic (Weber, 1958) and scientific management approaches (Taylor, 1967), to the open system theory view that identified the environmental influences impacting on firms. Contingency theory provides a main framework for this. It recognises the environment in which a business operates and assumes that an organisation's specific situation (external environment and internal environment such as technology, size, strategy) will determine the organisational performance (Laaksonen et al., 2009). It claims that the organisations' characteristics have to fit its context (external environment). Aspects of CT are also found in TCE and the major strategic management theories. For example, contingency

effects arise in TCE when analysing the relationship between uncertainty, specificity, and the transaction costs. TCE governance mechanisms can be seen as a way firms respond to these contingency effects. Contingency theory describes the environment in which firms operate in terms of: stability, complexity, market diversity and hostility (Donaldson, 2001). The theory has been heavily criticised for its lack of clarity with its theoretical statements and oversimplification of its explanations of organisational effectiveness (Schoonhoven, 1981). Contingency theory also does not specifically deal with exchange relationships as it deals with a firm as a whole. The main variables the theory contributes to are the external and internal environment and firm performance (Table 2-6).

Table 2-6: Contingency theory variables

Common variables
External environment
Internal environment
Firm performance

2.10 Resource theories

Resource theories provide important insights into the characteristics and performance of firms. They do this by analysing the resource characteristics of the exchange partners. The analysis of resource endowments has a long history in economics, but this has typically been applied to specific categories such as land, labour or capital. While not dealing explicitly with exchange relationships, exchange of resources is a key part of resource theories. The view of the firm as a collection of productive resources with the purpose of organising its own resources, together with resources from outside the firm, was developed by the seminal work of Penrose (1959), Wernerfelt (1984) and Wernerfelt (1995); resource theories move significantly further from the core assumptions of neoclassical economics. They share the rejection of perfect knowledge and competition with TCE, AT and GT, however, they explicitly reject the assumptions of divisibility and immobility of resources[16], as well as rational '"maximising" decision making. They adopt the behavioural perspective on decision making of Cyert and March (1963), where firms are a "coalition of participants with disparate demands" (p. 50) and different coalition members want the organisation to pursue different goals. These goals include economic factors as well as non-economic criteria.

[16] TCE implicitly assumes immobility of resources in its view of relationship-specific assets.

Resource dependence theory (RDT) introduces the concept of power (not just rationality or efficiency) as an important organisational goal, and describes how firms pursue multiple strategies to enhance their autonomy and pursue their own interests (Davis & Cobb, 2010).

The resource-based view (RBV) adopts a multi-stakeholder and multiple criteria perspective on firm performance (Barney, 1996; Connolly, Conlon, & Deutsch, 1980). This view suggests that, "different types of firm choose different criteria for evaluating their performance…" and "…that different individuals within a single firm choose different criteria to judge a firms performance" (Barney, 1996, p. 44). Profit maximisation and economic efficiency are no longer the only criteria.

2.10.1 Resource dependence theory and the importance of power

Resource dependence theory (RDT) focuses on resources and the dependence and power that arises from the need for critical resources from outside the organisation. With a focus on power, resource dependency theory identifies relationship characteristics as an important aspect of performance. In this view, exchange relationships involve interactions by firms to access critical resources. The central proposition is that an organisation's survival depends on its ability to obtain critical resources from the external environment (Preffer & Salancik, 1978). RDT recognises that goals and objectives "emerge as constraints imposed by various coalitions of interests" (Anderson, 1982, p. 19). Davis and Cobb (2010, p. 5) identify three core ideas of the theory:

(1) Social context matters.

(2) Organisations have strategies to enhance their autonomy and pursue interests.

(3) Power (not just rationality or efficiency) is important for understanding the internal and external actions of organisations.

It is the emphasis on power and the multiple tactics that organisations use to manage dependency that distinguishes the RDT from other approaches, such as TCE and the RBV (Pfeffer, 2003). Davis and Cobb (2010) argue that this notion of exchange based power was developed from concepts of power and dependency established by Emerson (1962). This theory identifies that the source of power is control over resources valued by other parties that are not available elsewhere. In other words, dependency arises when one party has scarce resources that are desired by the other. The relationship partner, who requires resources the other party has, becomes dependent and vulnerable to the exercise of power.

Power is, therefore, an expression of dependence and is related to how critical a resource is to the other organisation and the availability of alternatives (Emerson (1962).

Interdependence develops when each party is reliant on the other for scarce resources and acts to reduce power imbalances. Dependence is a function of the criticality of a resource to the organisation and the availability of alternatives (Davis & Cobb, 2010; Emerson, 1962; Pfeffer & Salancik, 2003). Building on this there has been considerable literature focusing on different types of power. For example French and Raven (1959), identify five categories of power: reward, coercive, legitimate, expert, and referent power. These have been further divided into mediated which incorporates reward, coercive and legitimate power with non-mediated power referring to expert and referent power . Mediated power is actively exercised by the more powerful organisation whereas non-mediated power reflects the inherent power based on the expertise of the organisation or the level of identification the dependent party has to the other organisation.

The concepts of RDT have much in common with other theories. It has a similar view of valuable and scarce resources as the RBV (Barney, 1991). They also relate to the TCE ideas of relationship-specific resources and the consequent dependence that creates the risk of opportunism in exchange relationships (Barney (1991). Emerson (1962) further conceptualises his ideas into social exchange theory. Therefore, these two theories have common roots and attempt to explain organisations' responses to the availability and control of scarce and valuable resources and the power and dependencies that result from this.

2.10.2 Managing effects of power and uncertainty in resource dependence theory

In a similar way to TCE, this theory focuses on governance relations with the exchange partners that minimise uncertainty and dependence and maximise autonomy in the least constraining way (Dwyer & Welsh, 1985; Stern & Reve, 1980; Wulf & Odekerken-Schröder, 2001). Resource dependency theory views mergers and acquisitions as responses to dependency (Davis & Cobb, 2010) whereas transaction cost economics focuses on increasing levels of vertical integration in response to transaction costs (Pfeffer & Nowak, 1976). Trust can also be important in the relationship, as there is a significant difference in a dependence relationship where one partner trusts the more powerful party. Despite this, RDT tends to focus on the existence and use of power to control others rather than on relationships of trust and commitment (Williamson, 1979).

In RDT, the ultimate goal of the firm is survival, and this is achieved through formal and/or semiformal associations with other companies to access critical resources. Managing these relationships becomes important due to competing and conflicting demands of the different parties. The performance of exchange relationships has frequently been evaluated using RDT to explain the influence of relationship quality dimensions with both economic and non-economic performance outcomes (Casciaro & Piskorski, 2005). "Whereas TCE seeks to manage uncertainty to achieve higher levels of efficiency, managing uncertainty in resource dependency theory is aimed at attaining higher levels of power" (Ireland & Webb, 2007, p. 486). Resource dependency theory is one of the first major organisational theories to identify social considerations as a major factor in how organisations decide to manage uncertainty. Nevertheless, the theory fails to distinguish adequately between coercive and non-coercive power, and trust is visibly absent from the theory's stream of research. Therefore, "resource dependency theory lacks the necessary components to fully explain differences among socioeconomic relations" (Ireland & Webb, 2007, p. 486).

RDT adds several important constructs to the theoretical synthesis (Table 2-7). From the perspective of this study, this theory identifies that relationship attributes, such as power and dependence, are important aspects of performance, as are supplier characteristics, in particular, the resources embedded in the relationships between the supplier and the buyer.

Table 2-7: Resource dependency theory constructs

Common variables
Resources
Power
Dependence

2.10.3 Competitive advantage and the resource-based theory (view) of the firm

The resourced-based theory of the firm (or resource-based view RBV) is another attempt to move beyond the traditional economic paradigm. This involves an integration of "organisational behaviour, economics and strategic management disciplines" (Ireland & Webb, 2007, p. 483). Although this approach does not explicitly deal with exchange relationships, it does so indirectly by focusing on the firm's resources that provide the competitive advantage. Competitive advantage is what gives firms increased profitability from exchange relationships. Firms establish exchange relationships with their customers and suppliers who are influenced by the resources and competitive advantage they achieve. RBV also attempts to explain the development of a firm's distinctive competency. It can be

argued that Coase (1937) introduced the idea of core competencies when he proposed that specialist firms had a greater capability to create value than those that were more diversified (Webster, 1992).

In the RBV, it is these core competencies and other difficult-to-copy resources that provide economic rents[17] that are, therefore, drivers of competitive advantage (Barney, 1991; Coase, 1937). These "competencies" are unique combinations of basic resources such as financial, legal, physical, human, organisational, informational, and relational resources (Barney, 1991; Morgan & Hunt, 1999) - see Table 2-8. Reed and DeFillippi (1990, p. 90) emphasise that competitive advantage is "only realised when a firm combines assortments of basic resources in such a way that they achieve a unique competency or capability that is valued in the marketplace". Furthermore, it is the combining of external resources accessed through partnerships, that when combined with a firm's internal resources, results in competitive advantage. The strategic management literature takes the view that the primary objective of strategy is to create a competitive advantage (Prahalad & Hamel, 2006; Webster, 1992). Competitive advantage is defined as the ability to produce greater economic value than competing firms (Barney, 1986; Conner, 1991). The resource-based view accepts the neoclassical economic view that firms combine resources as inputs to produce products. The distinctive approach of the RBV, is that it recognises that resources are neither perfectly mobile, divisible, nor are firms able to know how to best combine resources in the most efficient manner. The RBV takes a much wider view of resources than the traditional, land, labour and capital resources of economics. It includes these resources, but identifies the most important resources as the intangible capabilities of the firm (Croom et al., 2000). Resources and capabilities include all the assets, capabilities, information, knowledge and management processes controlled by a firm. They are both tangible and intangible and include physical capital, human capital and organisational capital resources (Conner, 1991; Porter, 1985) - see Table 2-8.

[17] Economic rents are "excess returns" above the "normal levels" that are generated in competitive markets (Ouchi, 1980).

Table 2-8: Firms' basic resources that can be combined to produce competencies

Financial	Financial resources are the capital that the firm has at its disposal. This can be cash reserves or as cash available through stock issues, loans, bonds, and other financial instruments.
Legal	Legal resources are assets the firm uniquely possesses because of governmental statute or a legally binding agreement between the firm and another party. This includes contracts, exclusionary licenses, and entitlements.
Physical	Physical resources are tangible assets, (other than labour and cash), that are used by the firm in production and marketing goods and services. Physical resources include: raw materials reserves, machinery, land, and production, storage, distribution, service, and retailing facilities.
Human	Human resources encompass the skills, knowledge, motivation and vision of the firm's employees.
Organisational	Organisational resources are the assets the firm possesses that arise from the organisation itself, these include the firm's culture and climate, structure, valued brand names, administrative systems, organisational routines and systematic processes that the firm acquires or develops.
Informational	This is the collective (rather than personal) knowledge of the organisation and the processes developed for organisational learning.
Relational	Relational resources exist between individuals and groups within the organisation as well as between the organisation eternal partners.

Adapted from (Barney, 1991)

The RBV provides a complementary view to TCA in identifying the importance of resources and capabilities, in deciding between market transactions and hybrid or hierarchal governance structures (Hunt & Morgan, 1995). The RBV looks at the resources and capabilities of a partner in relation to the firms' own endowments in evaluating make or buy decisions (Barney, 1991; Wernerfelt, 1984). It states that competitive advantage comes from valuable and rare resources and capabilities. If they are also hard to imitate and not substitutable, then they can provide a long-term competitive advantage (Barney, 1991). Managerial requirements include the organisational ability to exploit the resources and their ongoing maintenance (Halldorsson et al., 2007). Resource-sharing relationships, which are relationships characterised by commitment, trust and cooperation, take time to build and must be developed to ensure timely access to the resources they offer (Cyert & March, 1963).

The RBV draws on the behavioural paradigm in that it takes a multi-stakeholder view of performance (Mintzberg & Ahlstrand). This view suggests that different types of firms choose different criteria for evaluating their performance and that different individuals within a single firm choose different criteria to judge a firms performance (Morgan & Hunt, 1999). This is consistent with the behavioural perspective of March and Simon (1958, p. 153) that firms are a "coalition of participants with disparate demands" and that different coalition members want the organisation to pursue different goals (Barney, 1986, p. 50).

2.10.4 Cooperation and opportunism in the resource-based view

The RBV regards specific assets, in particular, human assets, as being critical to a firm's performance. Firm-specific assets provide valuable knowledge and capabilities (Chamberlin, 1962; Hofer & Schendel, 1978). The resource-based view acknowledges the importance of relationship-specific assets; however, it does not specifically focus on how firms avoid opportunistic behaviour as in AT and TCE. In this way, it tends to focus on creating value and positive advantage rather than avoiding negative consequences (Morgan & Hunt, 1999). An optimistic view of exchange relationships is what differentiates the RBV from TCE and the RDT. Companies realise that, "to be more competitive, they must have access to valuable resources and that relationships often offer the best route to obtaining these resources" (Conner, 1991). The RBV sees all different organisational forms as a result of firms seeking to acquire resources. This is either through "purchases in the marketplace (transactional exchange), the acquisition of firms having resources (vertical integration), creating or developing the resources internally, or through partnership with other organisations (relational exchange)" (Donaldson, 1990, p. 373; Morgan & Hunt, 1999).

2.10.5 Extending the resource-based view through the relational view

The relational view of the firm, put forward by Dwyer et al. (1987); Dyer and Singh (1998); Lusch and Brown (1996), focuses the RBV beyond the boundaries of the firm to encompass the capabilities and resources that existed within a firm's network of relationships. It is these inter-firm linkages and the combination of resources in unique ways that enable them to achieve competitive advantage. In this view, firms engage in relationships to obtain access to complementary resources that they do not have and could not, or would not, want to have (Dyer & Singh, 1998). A partner can offer a range of valuable resources, including technical capability, organisational capability, flexibility, reliability, knowledge, innovative capability, network position, international presence and low risk of discontinuity (Dyer & Singh, 1998, p. 660). This places supplier characteristics (human resources), relationship attributes and relationship quality (relational resources) as fundamental constructs in the extended RBV.

Molina and Dyer (1999) suggest that strategic alliances allow firms to procure assets, competencies, or capabilities, particularly specialised expertise and intangible assets, such as reputation. The unique combination of these resources means that these combined resources are more valuable, rare and difficult to imitate (Nooteboom, De Jong, Vossen, Helper, & Sako, 2000).

Nooteboom (1999) identifies that competitive advantage in partnerships are due to:

1) Investment in relationship specific assets.
2) Substantial knowledge exchange, including knowledge exchange that results in joint learning.
3) The combination of complementary, but scarce, resources or capabilities (typically through multiple functional interfaces), which results in the joint creation of unique new products, services or technologies.
4) Lower transaction costs than competitor alliances, owing to more effective governance mechanism.

The RBV emphasises resources and capabilities as central to creating value and achieving a competitive advantage. In this way, it focuses on the characteristics of the exchange parties rather than the nature of the transaction. The RBV also takes a positive view of accessing resources in exchange relationships and avoids focusing on the risk dependence creates and the possibility for opportunistic behaviour. It provides a more in-depth description of resources both within and external to the firm and how these can improve performance.

Table 2-9: Common variables from RBV

Common variables
Resources
Capabilities
Competitive advantage
Interdependence
Trust
Commitment
Cooperation

2.11 Sociological theories

This section focuses on the sociological theories that relate to supplier-buyer relationships. The main theories discussed are social exchange theory (SET), social capital theory (SCT) and network theory (NT). These theories focus on relationships and see economic relationships as a subset of wider human social interactions. SET, in particular, shares many assumptions with neoclassical economics and can be seen as an attempt to apply economic theory to social relations. It focuses mainly on the exchange transaction but broadens the objects of the exchange to include social factors, such as status, and develops a wider selection of decision criteria to include non-economic criteria, such as altruism. The characteristics of the exchange parties and their relationship are explicitly addressed. Supplier-buyer characteristics are defined in terms of economic and non-economic resources, and the nature of the relationship includes aspects of power and interdependence.

SCT and the NT tend to be descriptive in nature. Social capital describes both the nature of the network of relationships and the assets available from that network. There is a strong focus on the characteristics of the relationships between parties, and these are seen as resources (capital) available to improve the performance of both parties in a relationship.

2.11.1 Social exchange theory

Social exchange theory (SET) is an approach that focuses specifically on various kinds of personal and group exchange relationships and has been used extensively in organisational behavioural research. The basic assumption of SET is that social exchange relationships involve interactions that create interdependency and obligations (Cropanzano & Mitchell, 2005; Emerson, 1976). Following from this, SET proposes that human social behaviour can be predicted from an individual's values, perceptions of alternative behaviours, expectations of consequences to himself and others, and the social norms that individuals use to decide (Meeker, 1971; Thibaut & Faucheux, 1965). Only an interdependent relationship is defined as a social exchange as it requires an "exchange" where something is given in return for something else (Cropanzano & Mitchell, 2005). Social exchange theory has a broader view of resources than the economic and management theories. Resources can be both economic (money, goods and services) and non-economic, such as love, status and information (Foa & Foa, 1980; Foa & Foa, 1974). In this way, Emerson (1976, p. 347) defines a resource as "an ability possession, or another attribute of an actor giving him the capacity to reward (or punish) another specified actor". This means that resources are defined socially and are the "attributes of the relationship between actors" (Emerson, 1976, p. 348). Foa and Foa (1980) describe six types of exchange resources: love, status, information, money, goods and services.

Despite its sociological origins, SET is still closely aligned with neoclassical economic theory incorporating efficiency and rationality assumptions. It applies an "optimising" decision-making framework and economic assumptions of self-interest and utility maximisation to social relationships (Foa & Foa, 1980; Foa & Foa, 1974). In fact, Emerson (1976, p. 336) described SET as the, "economic analysis of non-economic social situations". Arndt (1983, p. 46) added that the, "maximising man notion of neoclassical economics is a central part of Social Exchange Theory". SET does, however, have significantly different assumptions about the "market" of exchange. For example, rather than assumptions of perfect competition and discrete transactions, social exchange assumes there are often long-term relationships between multiple parties, without equal distribution of power (Foa & Foa, 1980; Foa & Foa,

1974). Although SET has a basic rationality assumptions, Emerson (1976) identified that people do not always act rationally; therefore, SET has developed a number of additional exchange rules including "reciprocity, altruism, status consistency and competition" (Meeker, 1971, p. 485). In this way, different decision rules, such as rationality, altruism and reciprocity, are seen as orientations chosen depending on the type of social relationship involved in the exchange (Arndt, 1983; Cook, 1975; Emerson, 1976). Therefore, the choice of a rule may depend on such things as: who the exchange is with, if it is a long or short-term exchange relationship, and the power balance in the relationship. In this way, SET focuses on the characteristics of the exchange parties and the attributes of the relationship. In a similar way to resource dependency theory, SET has a focus on power. In fact, power and justice are the two of the most researched aspects of the theory. Emerson (1976) defines power in social exchange relationships as the ability to influence others' action or to get more per unit exchanged. This concept of power has important implications for the study of supplier-buyer relationships in terms of the determinations of price and margin. SET proposes that if power is unbalanced in an exchange relationship, then the amount the more powerful party gives up, will decrease until it reaches a subsistence level; this is the point at which the less powerful party will either leave the relationship or no longer be able to participate in exchange. In business this means price and margin decreases to near break-even point (or below) and, in a social relationship, this may be the just before the point of starvation or migration (defection) (Emerson, 1976). With its rationality assumptions and the concept of evaluation of "comparison levels" the theory has received some criticism. This is because it is unlikely, in the real world, firms are motivated or have the information to constantly assess comparison levels and alternatives (Anderson & Narus, 1984).

2.11.2 Social exchange theory and the relational view

Social exchange theory (SET) has been extensively used in research on buyer-seller relationships in the marketing literature (Anderson & Narus, 1984; Dwyer & Oh, 1987; Ganesan, 1994; Morgan & Hunt, 1999). The theory provides insights into the attractiveness of different relationships based on comparing outcomes with the available alternatives (Anderson & Narus, 1984; Dwyer & Oh, 1987; Ganesan, 1994; Morgan & Hunt, 1999). The theory also explicitly explains the role of dependency and power in relationships based on the outcomes provided by the partner and the availability of comparable alternatives (Wulf & Odekerken-Schröder, 2001). SET has provided a valuable development of what has been termed the "relational view" in supply chain and marketing literature in making the

exchange relationship the focus of research (Anderson & Narus, 1984; Dwyer et al., 1987; Ganesan, 1994; Morgan & Hunt, 1999). Although Dyer and Singh (1998, p. 660) identified trust as, “important for favourable exchanges”, the concept is not well explored in this theory (Anderson & Narus, 1984).

Cooperation is an important focus. Blau (1964, p. 876) proposed that, “interdependence reduces risk and encourages cooperation”. One of the, “basic tenets of SET is that relationships evolve over time into trusting, loyal, and mutual commitments”. SET views cooperation as a widely used and frequently employed strategy in exchange relationships. In cooperative strategies, change is achieved through agreements and joint planning rather through the domination of one party over the other. Some level of interdependence or power sharing is seen as necessary for cooperation to occur. “Each party must hold something of value for the other party and be capable of resisting the others' demands. Only then can cooperative strategies be effective. If a party cannot withhold something of value from another, there is no basis for the latter to make concessions. Agreements reached where the minimal conditions for cooperative exchange are absent simply express and formalise the clear-cut dominance of one party over the other. This does not mean that equality is a precondition for cooperative strategies. On the contrary, exchange between unequals is common (MacNeil, 1980).

Summarising the contribution and limitations of social exchange theory, Cropanzano and Mitchell (2005, p. 874) assert that it is, “One the most influential conceptual paradigms in organisational behaviour”. SET broadens the scope of exchange relationships by including intangible relational resources and non-economic decision rules. Despite its usefulness, theoretical ambiguities within SET remain. As a result, operationalisation of the theory relies on an incompletely specified set of ideas. Despite this there are a number of common concepts (Table 2-10) that are central to SET.

Table 2-10: Common constructs incorporated into social exchange theory

Common variables
Resources
Power
Reward
Dependence
Trust
Commitment
Cooperation

These variables are subject to different decision rules dependent on the type of social relationship involved in the exchange. These rules include: rationality, reciprocity, altruism, status consistency and competition.

2.11.3 Social capital and network theory

Social capital (SC) and network theory (NT) have become important concepts for diverse areas of study, such as public health, human resource studies and buyer-seller relationships. The concepts grew out of sociology and were initially described by Jacobs (1965), who referred to the networks of community relationships developed over time that provided a basis for trust, cooperation and collective action. In this way, the social capital and network perspectives are closely intertwined. Granovetter (1992, p. 33) asserts that, "there is an increasing sense that the network of relationships in which particular exchanges are embedded have properties that are greater than the sum of its parts and outcomes that cannot be explained by studying its parts alone". Despite this, the literature has paid only limited attention to social capital within exchange relationships and the supply chain context. Krause, Handfield, and Tyler (2007) define social capital as the "resources available to actors as a function of their location in the structure of their social relations". This means that SC involves both the network and the resources that are able to be accessed through that network (Nahapiet & Ghoshal, 1998). In the same way as the RBV, the social capital perspective emphasises that relationship resources exist beyond the boundaries of individual firms. Furthermore, along with TCE, it identifies the informal governance mechanisms used to mitigate opportunistic behaviours. SC describes the relationship-specific resources that enable the achievement of benefits resulting from cooperative behaviour and is concerned with the nature and structure of the resources embedded in a person's network of relationships (Burt, 1992; Granovetter, 1973; Lin, Ensel, & Vaughn, 1981; Seibert, 2001).

Social capital includes the actual and potential resources available through, and derived from, a network of relationships (Nahapiet & Ghoshal, 1998). These are termed 'capital' because, as with other forms of capital, social capital is a long-lived asset and is both appropriable and convertible (Adler & Kwon, 2002). Social capital resources can be substituted for economic resources by utilising strong connections with other parties, and these connections can be used for a variety of uses including obtaining economic resources. It has similarities to the resource-based view in that it views competitive advantage from a resource perspective. SC enables buyers and suppliers to access resources located in their

relationships. Unlike other forms of capital, social capital is jointly owned by the parties in the relationship (Nahapiet & Ghoshal, 1998). Committed partners have a greater understanding of why the relationship exists and their role in how they can contribute to the attainment of compatible goals. In this manner, goal congruence not only reduces the likelihood of conflicts (Jap, 2001) but also improves the joint returns for both parties because they perceive the combined potential of the relationship (Tsai & Ghoshal, 1998). SC is closely aligned with the concept of relationship quality, although they are derived from different theoretical backgrounds. There are relatively few empirical studies relating the role of social capital as a facilitator of relationship quality for both the buyer's and supplier's performance (Schulze & Lees, 2014; Srinivasan et al., 2011). Studies also indicate that there can also be downsides to social capital. Villena, et al (2011) builds on previous research (Gargiulo & Benassi, 2000; Granovetter, 1985; Uzzi, 1997) to postulate that social capital has both bright and dark sides. The bright side comes from fostering teamwork and reducing undesirable behaviour, both of which can positively influence performance. In contrast, Villena, et al (2011) also argue that as SC increases, the rate of benefits slow down and rigidities set in. They theorise that there should be a threshold at which these rigidities offset the benefits of social capital, and beyond which buyer performance declines. The specific dimensions of social capital were first identified by Nahapiet and Ghoshal (1998) as either cognitive, relational or structural (Tsai & Ghoshal, 1998).

Cognitive social capital

Cognitive social capital (CSC) involves shared vision, goals and culture, or in other words, what you have in common with the exchange partners. These also provide a shared culture, which provides the norms of behaviour that govern relationships. Similar cultures constrains undesirable behaviour incurred from the collective interests (Coleman, 1988). Cognitive social capital facilitates the exchange of resources because the buyer and supplier see the potential value of their resource integration and combination (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). It provides behavioural norms and common understanding of collective goals that encourage joint value creation by exploiting complementary resources and reduces the risk of opportunism and conflict (Gulati, Nohria, & Zaheer, 2000; Inkpen & Tsang, 2005; Jap & Anderson, 2003; Rossetti & Choi, 2005). Benefits include improvements in cycle time, cost, quality, delivery, flexibility and new product development, which increase long-term competitiveness and performance (Hult, Ketchen, & Slater, 2004). There can however, be performance losses due to high levels of cognitive social capital. Routines and

mental models emerging from accumulated cognitive capital can create rigidities that discourage independent thinking and creativity within the relationship (Autry & Griffis, 2008; Das, 2006) and, consequently, produce forms of "collective blindness" (Villena et al., 2011).

Relational social capital

Relational social capital (RSC) refers to personal relationships of trust, friendship, respect and reciprocity, developed through a history of interactions, that influence their behaviour (Granovetter, 1992; Nahapiet & Ghoshal, 1998) . This history of interaction enables the parties to prove their trustworthiness and establish norms of friendship and reciprocity within the relationship. Trust is one of the key aspects of RSC (Coleman, 1990; Fukuyama, 1995; Inkpen & Tsang, 2005). When there are high levels of trust there is less concern about the opportunistic behaviour of others (Blau, 1964; Jarillo, 1988) and, as trust develops, the parties will be willing to engage in more risky business transactions (Autry & Griffis, 2008; Das, 2006). Trust, friendship, respect and reciprocity are essential requirements for supply chain collaboration (Johnston, McCutcheon, Stuart, & Kerwood, 2004; Zaheer, McEvily, & Perrone, 1998). However, as RSC increases, it can create occasions for opportunistic behaviour (Granovetter, 1985). Excessive levels of trust may lead the buyer to reduce efforts for monitoring, vigilance, and, therefore, reducing safeguards against a supplier's potential misconduct. Such a reduction in control mechanisms puts the supplier in a better position to take greater advantage of the buyer if the supplier wishes to (Gargiulo & Ertug, 2006; Wuyts & Geyskens, 2005).

Structural social capital

Structural social capital (SSC) refers to the pattern of connections between parties that is, whom you know and how you reach them (Burt, 1992). This concept is the most closely aligned with network theory. A number of authors believe building SSC is important for achieving benefits in supply chains (Lawson, Tyler, & Cousins, 2008). Frequent interaction between multiple contact points between the buyer and suppliers provides a greater diversity of reliable information, encourages faster problem resolutions and also better inter-firm coordination (Heide & Miner, 1992; Koka & Prescott, 2002; Uzzi, 1997).

2.12 Network theory

Network theory (NT) is has been applied to a wide range of disciplines including, physics, engineering, biology as well as economics and sociology. Within organisational theory the Industrial Marketing and Purchasing group (IMP) were early proponents of a network

approach which they applied to business-to-business marketing (Gebert-Persson, Mattsson, & Öberg, 2014). Their approach has been further refined and developed over the last three to four decades. Despite this the IMP methodology has been criticised because a unified and integrated approach is still missing and it represents an approach rather than a theory (Ford & Mouzas, 2013).

The broader perspective of NT focuses on the structure and nature of the network of relationships within which the firm is embedded. The firm's continuous interaction with other players becomes an important factor in the development of new resources (Haakansson and Ford, 2002). Relationships combine the resources of two organisations to achieve more advantages than through individual efforts alone. Such a combination can be viewed as a quasi-organisation (Haakansson and Snehota, 1995; Haakansson, 1987). The value of a resource is based on its combination with other resources, which is why inter-organisational ties may become more important than possessing resources *per se*. Furthermore, Håkansson and Snehota (1989, p. 262) state that, "Some of the organisation's relationships with other organisations in the network constitute, in themselves, one of the most if not the most valuable resources that it possesses". Thus, the resource structure determines the structure of the supply chain and becomes its motivating force. Within organisational systems NT contributes profoundly to an understanding of the dynamics of inter- organisational relations by emphasising the importance of "personal chemistry" between the parties, the build-up of trust through positive long-term cooperative relations and the mutual adaptation of routines and systems through exchange processes (Burt, 1992).

The parties gradually build up mutual trust through the social exchange processes. A network does not seek an optimal equilibrium, but is in a constant state of movement and change. Links between firms in a network develop through two separate, but closely linked, types of interaction: exchange processes (information, goods and services, and social processes) and adaptation processes (personal, technical, legal, logistics, and administrative elements) (Johanson and Mattsson, 1987).

Contribution of social capital and network theory

Though they are stand-alone theories NT and SCT are complimentary in their description of interfirm relationships. NT assumes that inter-firm relationships are embedded in a network structure (structural social capital) and this affects the behaviour and expectations of firms (Halldorsson et al., 2007). The relational and cognitive aspects of social capital, describe the

characteristics of these network relationships. Many traditional studies of supply chain relationships take a limited linear view and only analyse the dyadic relationships between firms in the supply chain. This approach ignores the complex interdependencies and relationships between firms that exist in a larger supply network (Halldorsson et al., 2007). SCT in combination with NT identify the way individuals and groups have access to distinct resources due to their location in different social network structures (Halldorsson et al., 2007). In this way, these theories are able to describe supplier characteristics in terms of the resources they provide and have access to as well as the attributes and quality of the relationships in their network. The structure of networks may vary considerably, and this has a significant effect the access to resources for different individuals or groups which affects the way they interact. There is a diversity of views on how social network structures affect network behaviour and performance outcomes. There are also differing perspectives on what type of relationships and network structures are more conducive to cooperative behaviour and improved supply chain performance (Burt, 1992; Burt, 2004; Omta, Trienekens, & Beers, 2001). SCT and NT have much in common with the resource-based view and the relational view and share many common constructs (Table 2-11).

Table 2-11: Social capital and network theory variables

Common variables
Social capital resources
Economic resources
Trust
Network structure
Cooperation

2.13 Summary of theoretical approaches

This review of theoretical approaches shows that there is in fact a significant overlap between the economic, managerial and sociological theories. Once the rigid assumptions of neoclassical economics are relaxed, the human psychological and sociological factors cannot be ignored. Each approach has a different emphasis but they share many common elements. They all contribute in different ways to understanding the supplier characteristics, relationship attributes and quality and supplier performance.

Transaction cost economics focuses on the nature of the transaction, transaction costs and governance mechanisms, while AT focuses on the parties to the transaction and the costs involved in monitoring the relationship. Both AT and TCE are concerned with the management of opportunistic behaviour arising in a relationship when one party engages the services of an independent agent. They also focus on the different costs involved in

moderating opportunistic behaviour through different governance mechanisms. In TCE, these are markets, hybrids or hierarchies and, in AT, these are different types of contract. TCE and AT see superior performance primarily arising from minimising production costs and the costs involved in managing the risks of opportunistic behaviour in exchange relations. The review has shown that TCE has a limited view of the value created through exchange relationships, especially those arising from the sharing of resources and the benefits derived from learning and developmental competencies (Lazzarini et al., 2001). Despite this, many of the constructs are common to the other theories including: relationship specific assets, uncertainty, dependence, power, trust, cooperation and opportunism, and relationship-based partnerships.

The RBV looks more specifically at value creation and emphasises that competitive advantage (performance) arises from resources and capabilities that are located with the individual firm (Coleman, 1990). The relational view and resource dependency theories extend this to focus on the resources that are accessed through relationships with other parties. The RBV also shares many constructs with the other theories, including: resources, power, interdependence, trust, commitment, cooperation and competitive advantage (performance).

Social exchange and social capital theories combined with the network view specifically analyse the structure, nature and function of the relationships themselves. Each of these theories contributes to the study of relationship quality and supplier performance in supply chains. Although these approaches focus on the structure of the relationship, they too have common theoretical constructs. These include: resources (social capital and economic), trust and cooperation. Despite the apparent differences of the theories in the literature review, there are, in fact, many similarities and they share many constructs. These essentially, describe the same concept even though the definitions have a different emphasis and description.

Table 2-12 demonstrates this by showing the common constructs and the multiple theories that utilise these. Furthermore, Table 2-13 describes each of the theories discussed in the literature review, identifies the core literature relating these, the theoretical assumptions they are based on and the key variables associated with each theory. This demonstrates that many of these ideas are common to a variety of theories and this provides a basis for the multi-theoretical approach of this research.

The literature review was able to show that other than neoclassical economics the other theories, to a greater or lesser extent, integrated assumptions from the behavioural and economic paradigms (Table 2-13). This confirms that both the economic and behavioural paradigms are necessary to explain exchange relationships. These paradigms should be seen as complimentary rather than in competition (Stern & Reve, 1980). The common constructs identified in the literature review can be used in the measurement of the supplier and relationship characteristics, relationship quality and supplier performance. This is consistent with the views of Krackhardt (1992) and Nelson (1989) who, among others, recommend a multi-theoretical approach as they believe this provides greater explanatory power than a single theory approach. The theoretical framework of this research will, therefore, draw constructs from each of these approaches, rather than limiting variables to those that a particular theory focuses on.

Table 2-12 outlines the common concepts and theoretical connections.

Table 2-12: Common concepts and theoretical connections

Construct	Theories
Trust	Transaction cost economics (calculative trust), game theory, relational view, resource-based view, social exchange theory, social capital theory, network theory.
Commitment	Relational view, resource-based view, social exchange theory, social capital theory, network theory.
Satisfaction	Relational view.
Specific asset resources	Transaction cost economics, game theory, the relational view, resource-based view, social exchange theory, social capital theory, network theory.
Social capital resources	The relational view, resource-based view, social exchange theory, social capital theory, network theory.
Value	Neoclassical economics, transaction cost economics (calculative trust), game theory, relational view, resource-based view, social exchange theory, social capital theory, network theory.
Dependence	Relational view, resource-based view, social exchange theory, social capital theory, network theory, resource dependence theory, network theory.
Power	Resource dependence theory, political economic paradigm, social exchange theory.
External environment	Contingency theory, transaction cost economics, network theory, political economic paradigm
Opportunism	Transaction cost economics, agency theory, game theory, the relational view, resource-based view, social exchange theory, social capital theory, network theory.
Cooperation	The relational view, resource-based view, social exchange theory, social capital theory, network theory.
Competitive advantage	The relational view, resource-based view, social exchange theory, social capital theory, network theory.

Table 2-13: List of theories, assumptions and variables

Theories	Assumptions	Constructs
Economic theories		
Neoclassical economic theory (Becker, 1976; Smith, Cannan, & Lerner, 1937; Veblen, 1965)	Perfect information, perfect competition, mobile resources, rational-maximising decision making, discrete market-based transactions, self-interest.	Price, marginal cost, marginal revenue, marginal utility, rational agents, profit, equilibrium and resources (land, labour, capital).
Transaction cost economics (Coase, 1937; Williamson, 1979)	Bounded rationality, efficiency, rational-maximising decision making, self-interest.	Transaction costs, governance mechanism, specific assets, opportunism, dependence, power, environmental uncertainty and calculative trust.
Agency theory (Carlos, 1992; Eisenhardt, 1989; Jensen & Meckling, 1976)	Bounded rationality, Interdependence, rational-choice decision making, self-interest.	Contract type (behavioural or outcome based), opportunism and power.
Game theory (Axelrod, 1984; Hill, 1990)	Bounded rationality, Interdependence, rational choice, decision making, self-interest.	Payoffs, uncertainty, cooperation, opportunism, dependence, power and trust.
Managerial theories		
Contingency theory (Donaldson, 2001; Galbraith, 1973; Lawrence & Lorsch, 1967)	Rational maximising decision making.	Internal environment, external environment and firm performance.
Resource dependence theory	Sequential satisficing decision making, bounded rationality, firm as a coalition of interests.	Resources, power and dependence.
Resource theory (Resource-based view) (Barney, 1991; Poppo & Zenger, 1997; Wernerfelt, 1984)	Immobility and indivisibility of resources, bounded rationality, Sequential satisficing decision making.	Resources, competitive advantage, capabilities, interdependence, trust commitment and cooperation.
Relational view (Dwyer et al., 1987; Dyer & Singh, 1998; Molina & Dyer, 1999; Morgan & Hunt, 1999)	Immobility and indivisibility of resources, bounded rationality, Sequential satisficing decision making.	Resources and capabilities, specific assets and competitive Advantage.
Sociological theories		
Social exchange theory (Anderson & Narus, 1984; Emerson, 1976; Thibaut & Faucheux, 1965)	Rational-maximising decision making and bounded rationality.	Reward, resources, comparison level, reward, power, dependence, trust, commitment and cooperation.
Social capital theory (Granovetter, 1973; Nahapiet & Ghoshal, 1998)	Rational-maximising decision making and bounded rationality.	Interdependence and social capital resources. Economic resources, cooperation and trust.
(Industrial) **Network theory** (Håkansson & Snehota, 1989; Mattsson & Johanson, 1992)	Bounded rationality and sequential satisficing decision making.	External environment, social and physical resources, interdependence and network structure.

2.14 Literature review relationship quality

2.14.1 Introduction

Relationship quality (RQ) is a central variable in this research. However, it is often poorly defined and is used with a variety of meanings in the literature. It is, therefore, important to clearly define this term in the context of supplier-buyer relationships. To do this, it is necessary to understand the variety of meanings of quality and the development of the use of the term in the management context. Therefore, this section covers, the origin and development of the relationship quality construct. Later sections contain definitions of the other core variables used in the study and how they are measured. Many of the constructs used in this research have diverse meanings in the literature and vary in the way they are used in the different theories. It is, therefore, important that the operationalisation of these constructs is clearly defined.

2.14.2 The concept of quality

The concept of quality is a complex, multifaceted and elusive construct that is difficult to define (Elvers & Rosén, 2004; Garvin, 1984; Heyworth, 2007; Parasuraman, Zeithaml, & Berry, 1985) The Oxford Dictionary defines quality as "the standard of something as measured against other things of a similar kind; the degree of excellence of something, and a distinctive attribute or characteristic possessed by someone or something" (Oxford Dictionaries, 2015). This implies that quality is a description or measure of the characteristics or attributes a thing possesses. Quality, therefore, needs to be defined with regard to the specific attribute it is measuring and will have unique dimensions depending on the attributes and characteristics of the thing and the standards that are applied to it by humans (Heyworth, 2007). This implies that there is no absolute measure of quality as it is a social construct. Therefore, when people refer to relationship quality in exchange relationships, they are attempting to define the nature and characteristics of the exchange relationship and the relative value or standards placed on these attributes. Elvers and Rosén (2004) explain that in everyday language quality refers to the position on a scale of bad-good-excellent that a user places on a specific product, both in regard to its intended use and in comparison, to products that are similar.

Within business management literature the concept of quality was first developed in relation to product quality in industrial products and processes in the United States and Japan following the Second World War (Heyworth, 2007). A further development of the quality

concept arose in the study of service quality. There were significant characteristics, however, that made service quality different from product quality (Parasuraman et al., 1985). In particular, the intangible nature of services, the lack of consistency in delivery and that production and consumption occurred simultaneously (Parasuraman et al., 1985; Parasuraman, Zeithaml, & Berry, 1988). There have been many other developments in the use of the quality concept in the literature; these include, quality of life (Andrews & Withey, 202), data and information quality (Redman & Blanton, 1997) and relationship quality (Athanasopoulou, 2009).

2.14.3 Development of the literature on relationship quality

The actual concept of relationship quality emerged from the literature on relationship marketing and is now a core concept within the marketing discipline with similarities to other quality constructs already discussed, such as product and service quality (Leonidou et al., 2014). Dwyer et al. (1987) were one of the first to refer to relationship quality in exchange relationships in discussing the buyer's interest in maintaining a “quality relationship” (p. 14). This was a very similar concept to the term “relationship climate” used by Reve and Stern (1986) .The specific use of the term “relationship quality” was introduced by Dwyer and Oh (1987, p. 348) and was also used by Crosby, Evans and Cowles (1990) in research on service quality. Subsequently, Robicheaux and Coleman (1994) referred to the concept of “relationship quality” (p 43) in their analysis of marketing channel relationships. This early literature (Crosby, Evans, & Cowles, 1990; Dwyer et al., 1987; Kumar, Scheer, & Steenkamp, 1995) focused on relationship quality from the customers’ or buyers’ perspectives and used a consumer/buyer behaviour approach to analysing relationship quality (Lages, Lages, & Lages, 2005). Subsequent authors have studied relationship quality from different perspectives as well as at different stages in the supply chain (Figure 2-4). Relationship quality in supply chain relationships differs significantly from product and service quality constructs in that there is always the perspective of both the buyer and suppler on relationship quality. In contrast, it is the customers’/consumers’ perspective that is most important in the product and services quality construct.

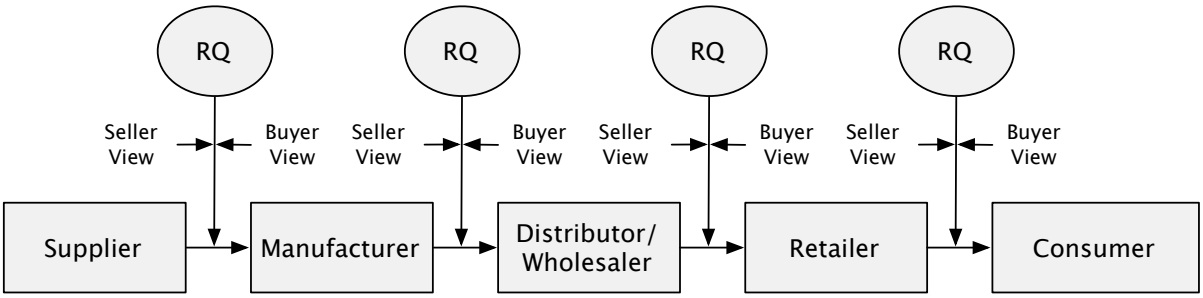

Figure 2-4: Differing perspectives on relationship quality in the supply chain

Relationship quality has now been studied from a variety of contexts and supply chain positions (Figure 2-4). For example, between manufacturers/suppliers and distributors/resellers (Dorsch, Swanson, & Kelley, 1998; Kumar et al., 1995), service firms and their customers (Roberts, Varki, & Brodie, 2003), between salespeople and customers (Bejou, Wray, & Ingram, 1996) and between exporting firms their importing firm partners (Lages et al., 2005).

2.14.4 Defining relationship quality

Despite the complexity of the relationship quality concept, there is a significant consensus in describing the concept. It has been defined as a higher order construct made up of a number of distinct, but related, dimensions (Crosby et al., 1990; Dwyer et al., 1987; Kumar et al., 1995; Lages et al., 2005). Lages et al. (2005, p. 1041) explain that relationship quality is a construct that, "reflects the overall strength of a relation". The most common dimensions used to define relationship quality are trust, commitment and satisfaction (Crosby et al., 1990; Dorsch et al., 1998; Hewett, Money, & Sharma, 2002; Schulze, Spiller, & Theuvsen, 2006; Ulaga & Eggert, 2005). Of these three, trust is universally included, usually with commitment as the second dimension; however, satisfaction is not always included. For example, Dwyer et al. (1987) comment that trust, commitment and disengagement are important for understanding the development of long-term relationships as well as conflict. Kumar et al. (1995) use trust, commitment and two other constructs to represent engagement, which are: willingness to invest and expectation of continuity. Obadia and Vida (2011) and Leonidou et al. (2014) define relationships as comprising cooperation, trust, commitment, and communication. This research will use trust, commitment and satisfaction as the three main dimensions of relationships quality as these are the most commonly used variables. Also, as explained in the next section, these are attitudinal variables rather than behavioural variables. This research interprets relationship quality as an attitude towards

the buyer/processor incorporating trust, commitment and satisfaction, which leads to the behavioural supplier performance outcomes.

2.14.5 Cognitive assessment, affective attitudes and behaviours in exchange relationships

As mentioned in the previous section, one of the reasons for the lack of consistency with the dimensions of relationship quality is that many authors do not differentiate between cognitive variables, affective variables and behaviour outcomes. Cooperation, opportunism, communication, loyalty and delivery quality are all clearly behaviours, whereas trust and satisfaction and commitment are attitudes. Few authors draw on psychological frameworks to differentiate these. An exception is Ulaga and Eggert (2006) who draw on the Ajzen and Fishbein (1977) theory of reasoned action to differentiate the rational-cognitive and performance based construct 'relationship value' from the attitudinal-affective relationship quality concept. They conclude that the cognitive construct, relationship value, is an antecedent to relationship quality, including commitment, satisfaction and trust, and that these lead to subsequent exchange relationships behaviours. In this way, they make a clear distinction between what is a rational evaluation of the trade-offs between the benefits and sacrifices of the exchange relationship and how these influence the formation of affective attitudes that form relationship quality. Furthermore, they make a distinction between exchange relationship behaviours, such as opportunism and cooperation, and the affective attitudes of trust, satisfaction and commitment that are antecedents of these behaviours (Ajzen & Fishbein, 1977; Ulaga & Eggert, 2006). In the same way, this research makes a clear separation between the cognitive assessment of relationship value, the affective attitudes involved in the relationship quality construct and supplier performance as behavioural outcomes.

2.14.6 Social capital and relationship quality

Social capital (SC) and relationship quality (RQ) are similar concepts that have originated from quite different theoretical backgrounds. The social capital concept emerged out of sociology and was originally applied to networks of community relationships. In contrast, relationship quality grew out of the service quality and relational marketing literature. This difference means there has been little research on how these two concepts relate to each other, even though they both involve an evaluation of the strength and quality of a relationship. SC borrows the concept of capital from economics, and it originally referred to the value of resources that were available to a partner. It is now more commonly used to

refer to the strength of a relationship between partners. In this way, the two constructs have become more closely aligned. Three dimensions define social capital: relational SC, which includes trust, friendship, and reciprocity; cognitive SC which describes shared vision and goals; and structural SC, which describes the frequency and number of interactions with a partner. The first two of these are very closely related to relational quality. The third dimension, which is structural SC, however, is more related to network theory, and provides a valuable evaluation of the strength of the relationships.

Although relationship quality has developed out of the product and service quality literature, it has become an important concept in the study of exchange relationships. Furthermore, despite the variety of definitions of the construct, it is possible to identify some common dimensions, which can be further clarified when understood from an attitudinal and behavioural perspective. This leads to trust, commitment and satisfaction being the commonly accepted dimensions, that will be described in the next chapter. Furthermore, the definition of relationship quality shares many attributes with social capital. An important part of this research will be to investigate if these are, indeed, separate constructs.

Chapter 3: Hypothesis development

3.1 Theoretical framework

The focus of the research was to identify the effects of supplier characteristics, relationship attributes and relationship quality on supplier performance. To achieve this supplier characteristics, relationship attributes and relationship were defined as the independent variables with supplier performance as the dependent variable (Figure 3-3). The theoretical framework for this research draws on the literature review as well as the proposed research framework that emerged from the research aims and research questions described in chapter one.

Table 2-12 demonstrates that there are number of key constructs relating to exchange relationships that are common to a number of these theories. The objective of the literature review was to identify commonalities in the different theories and identify how they can be synthesised into a new theoretical perspective. The common dependent variables that emerged from the research were: trust, commitment, satisfaction, resources (social capital, specific assets, economic and social resources) value, dependence, power, competitive advantage (performance), cooperation, opportunism and the external environment (

Table 2-12). These variables form the basis of the scale items incorporated into the survey instrument used for the data collection. These variables and their scale items are described in more detail in chapter 5. Resources are a common construct in nearly all of the theoretical approaches from the neoclassical economic to the sociological theories, even though definitions of what is classified as a resource vary considerably. From this, social capital and relational resources and specific assets (resources) emerge as central concepts to the study of relationship quality and supplier performance. The theoretical framework identifies how a supplier's resources and capabilities as well as relationship attributes and relationship quality affect the independent variable supplier performance (competitive advantage). Figure 3-1 describes the theoretical framework developed by Athanasopoulou (2009) to explain relationship quality, buyer-supplier characteristics and performance outcomes. This framework also includes other characteristics: the environment, offer characteristics, relational benefits and satisfaction (Athanasopoulou, 2009).

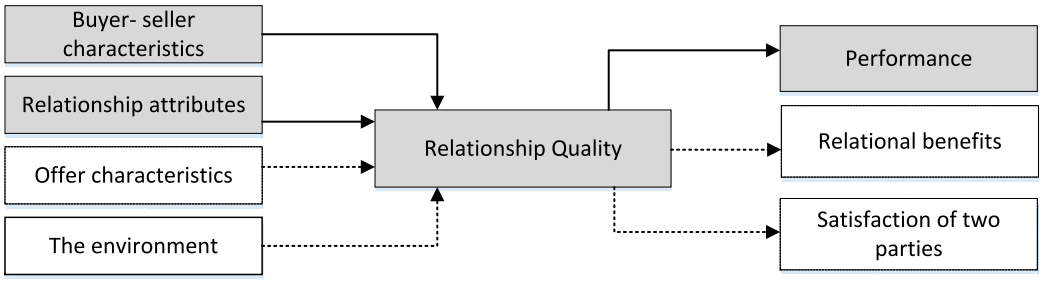

Figure 3-1: Theoretical framework of relationship quality, buyer-supplier characteristics and performance outcomes

Adapted from (Athanasopoulou, 2009)

The framework adapted for this research seeks to explain supplier characteristics and relationship attributes and their effect on relationship quality and supplier performance (grey boxes - Figure 3-1). The research did not incorporate the other characteristics: relational benefits, satisfaction, offer characteristics and the environment (white boxes - Figure 3-1). Two theoretic models were hypothesised, firstly without relationship quality as an intervening variable (Figure 3-2) and, secondly, proposing relationship quality as a mediating variable (Figure 3-3).

Figure 3-2: Theoretical Model 1 - direct relationship between supplier characteristics, relationship attributes and supplier performance

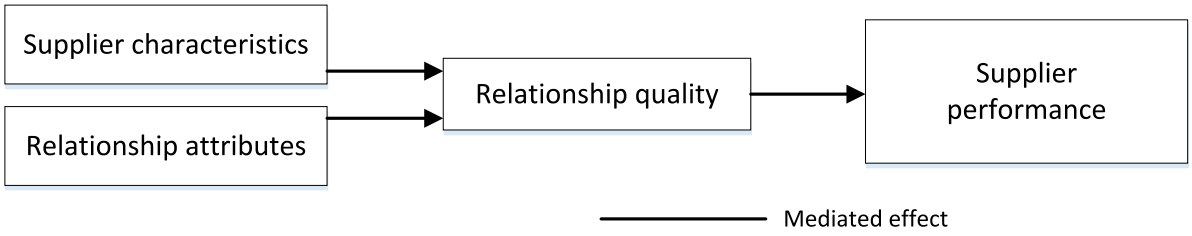

Figure 3-3: Theoretical Model 2 - relationship quality as mediating variable

Table 2-13 describes the main theories relating to supplier-buyer relationships and their assumptions based on the behavioural and economic paradigms and the main constructs associated with these. The theoretical framework for this research was developed from the synthesis of these theories and the constructs (Figure 3-4).

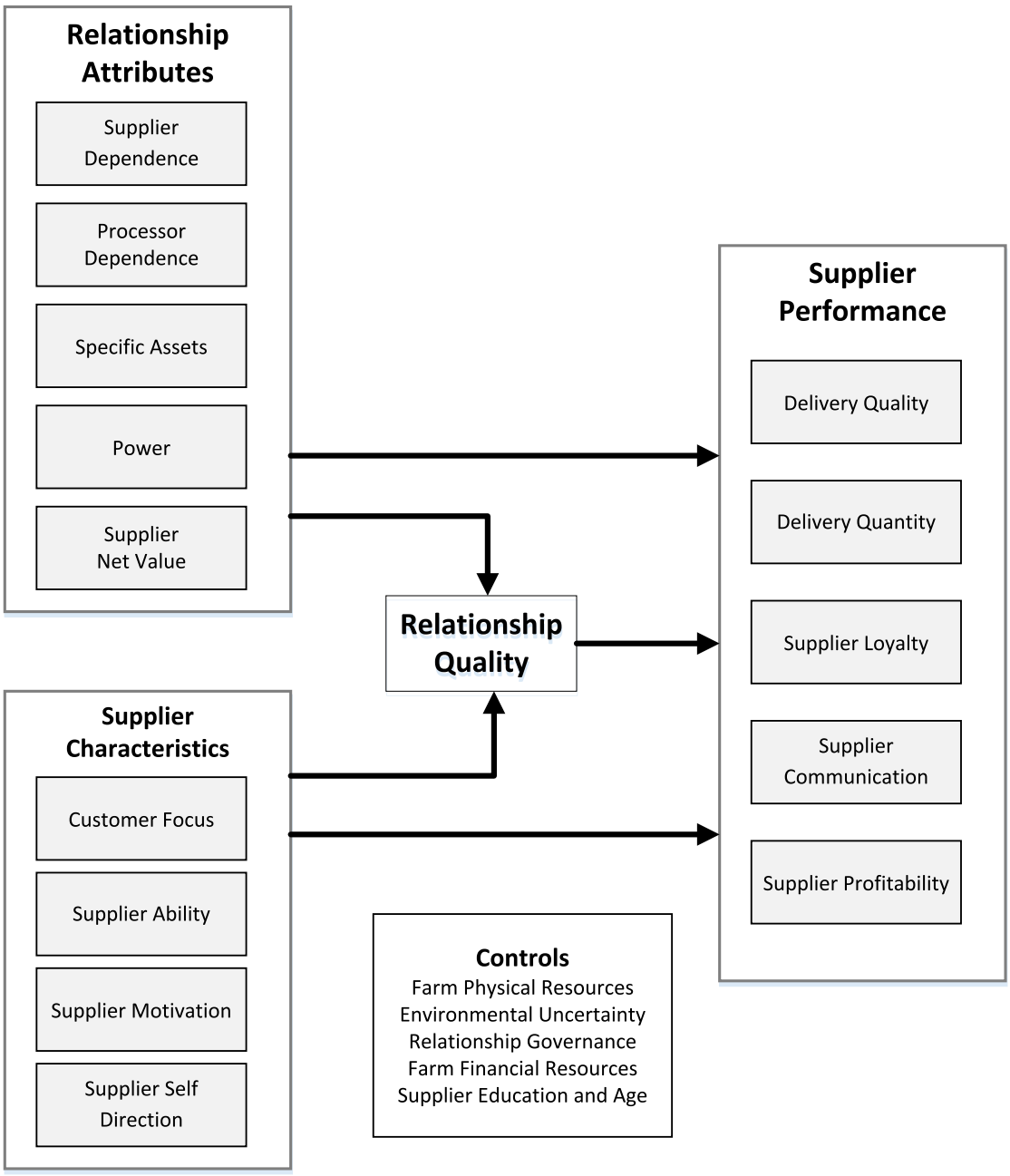

Figure 3-4: Theoretical framework developed from multi-theoretical synthesis

The theoretical framework (Figure 3-4) is grounded in a resource-based view but draws common constructs from a number of theories including TCE, SCT and others. The framework proposes that supplier characteristics and relationship attributes determined supplier performance. Relationship attributes and supplier characteristics are an important aspect of supplier performance and competitive advantage. The theoretical framework includes mostly intangible resources. Tangible resources, such as the farms' physical resources are included in the controls. This is because the research focuses specifically on the suppliers rather than the resources they own. In a similar way, supplier performance is developed from competitive advantage with the individual variables identified as supplier

performance factors that led directly to a competitive advantage for the buyer. In the following chapter the definition and dimensions of these variables are described.

3.1.1 Hypotheses

Each of the hypotheses are organised according to the research questions (see section 1.4.2)

Structure of the relationship quality construct

These hypotheses relate to the first research question which is to establish how relationship quality conceptualised and how can it be measured.

H1a-g: Relationship quality is a construct that consists of the dimensions of relationship quality and social capital

These include structural social capital, relational and cognitive social capital, trust, commitment, satisfaction with communication, satisfaction with price and satisfaction with the organisation (Figure 3-5).

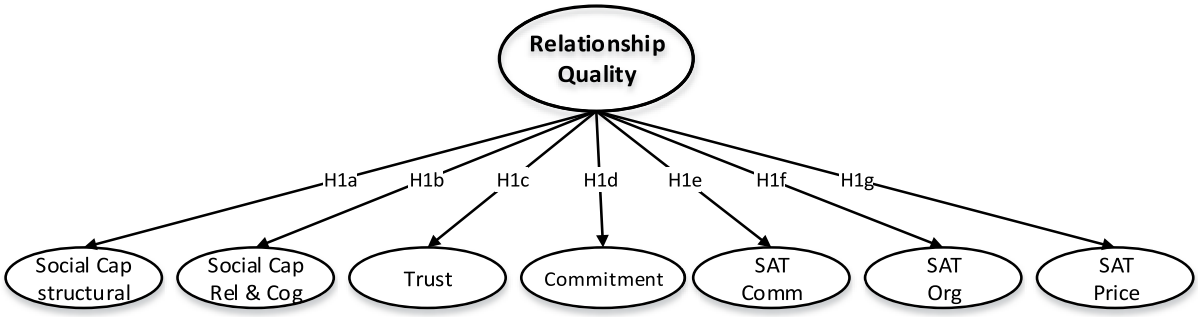

Figure 3-5: Hypothesis model of the relationship quality construct consisting of first order factors

H2a-i: Social capital and relationship quality are distinct constructs.

The sub-dimensions of social capital incorporate structural and relational/cognitive social capital. The sub-dimensions of relationship quality include trust, satisfaction and commitment. Satisfaction is made up of sub-dimension including satisfaction with performance, communication and price (Figure 3-6).

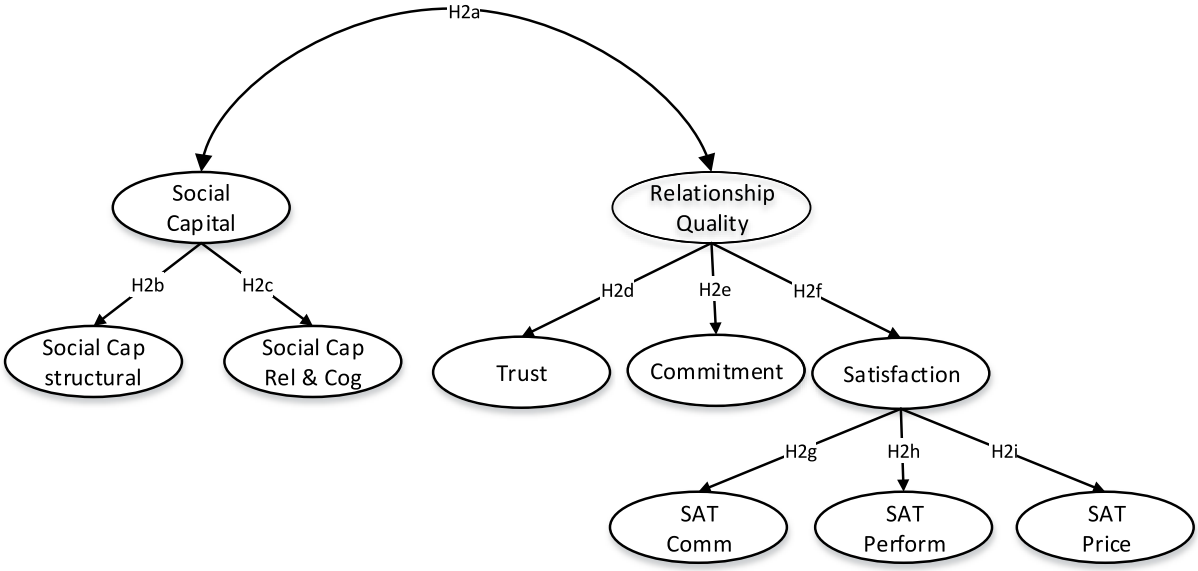

Figure 3-6: Hypothesis model of the relationship quality and social capital acting as distinct constructs

H3: Social capital is a sub-dimension of relationship quality.

In this model, relationship quality has sub-dimensions that include social capital, trust, satisfaction and commitment. Social capital has sub dimensions that are: structural, relational and cognitive social capital. Satisfaction is made up of sub-dimension including satisfaction with performance, communication and price. Social capital and relationship quality are distinct constructs (Figure 3-7).

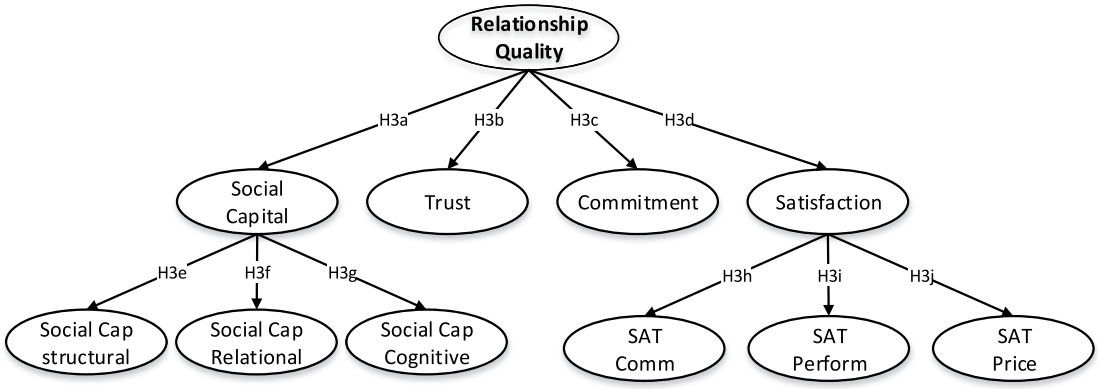

Figure 3-7: Hypothesis model of the relationship quality construct incorporating social capital, trust, commitment and satisfaction.

H4: a–e Relationship quality is a sub-dimension of a social capital.

In this model, social capital has structural and relational/cognitive as sub-dimensions as well as relationship quality. Relationship quality has trust commitment and satisfaction as sub-dimensions. Furthermore, Satisfaction has three sub-dimensions that include satisfaction with performance, communication and price (Figure 3-8)

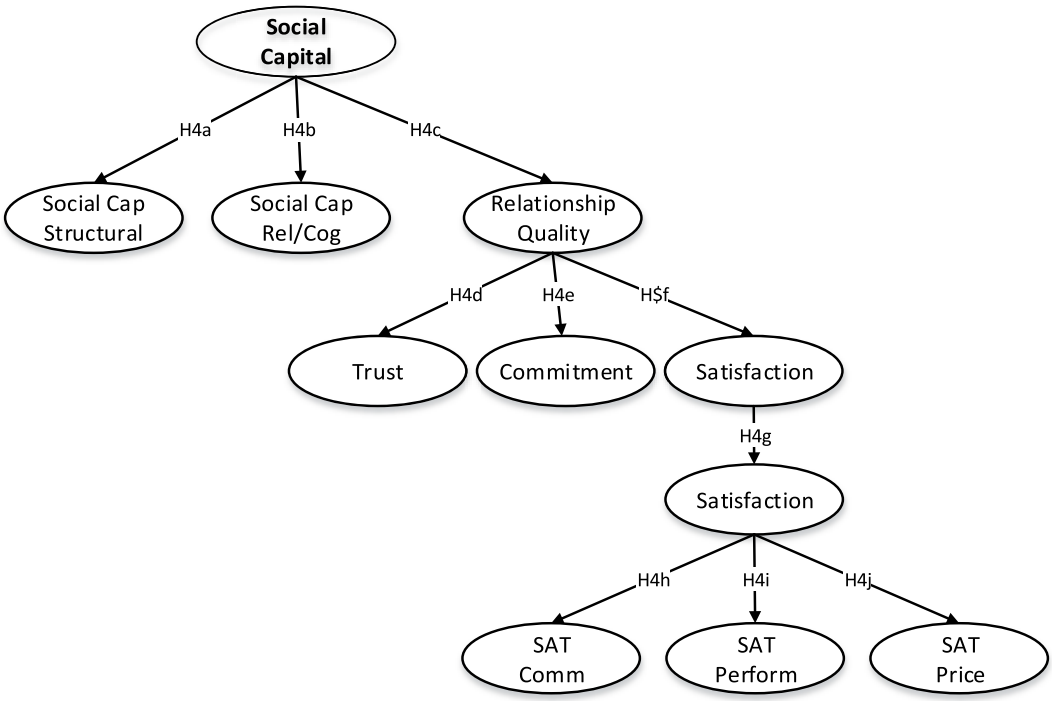

Figure 3-8: Hypothesis model incorporating relational quality as a sub dimension of social capital

The analysis of these models of relationship quality and social capital were used to determine the structure of the relationship quality construct that was used in the theoretical framework model (Figure 3-9).

Theoretical framework model

The theoretical framework seeks to understand supplier characteristics and relationship attributes and their effect on relationship quality and supplier performance (Figure 3-9). The hypotheses derived from this model (Figure 3-9) relate to the following research questions:

- What are the antecedents to relationship quality?
- Are there specific supplier characteristics and relationship attributes that affect supplier performance and how does relationship quality mediate these relationships?
- How does improving relationship quality affect supplier performance?
- How can processors influence supplier performance?

Hypothesis H5 – H13: The effect on supplier performance by relationship attributes and supplier characteristics is fully mediated by relationship quality

Relationship attributes include: supplier dependence, processor dependence, specific assets, power, supplier net value as well as supplier characteristics which include: customer focus, supplier ability, supplier motivation and self-direction, affect supplier performance which is made up of: delivery quality, delivery quantity, supplier loyalty, communication and profitability. These relationships are fully mediated by relationship quality.

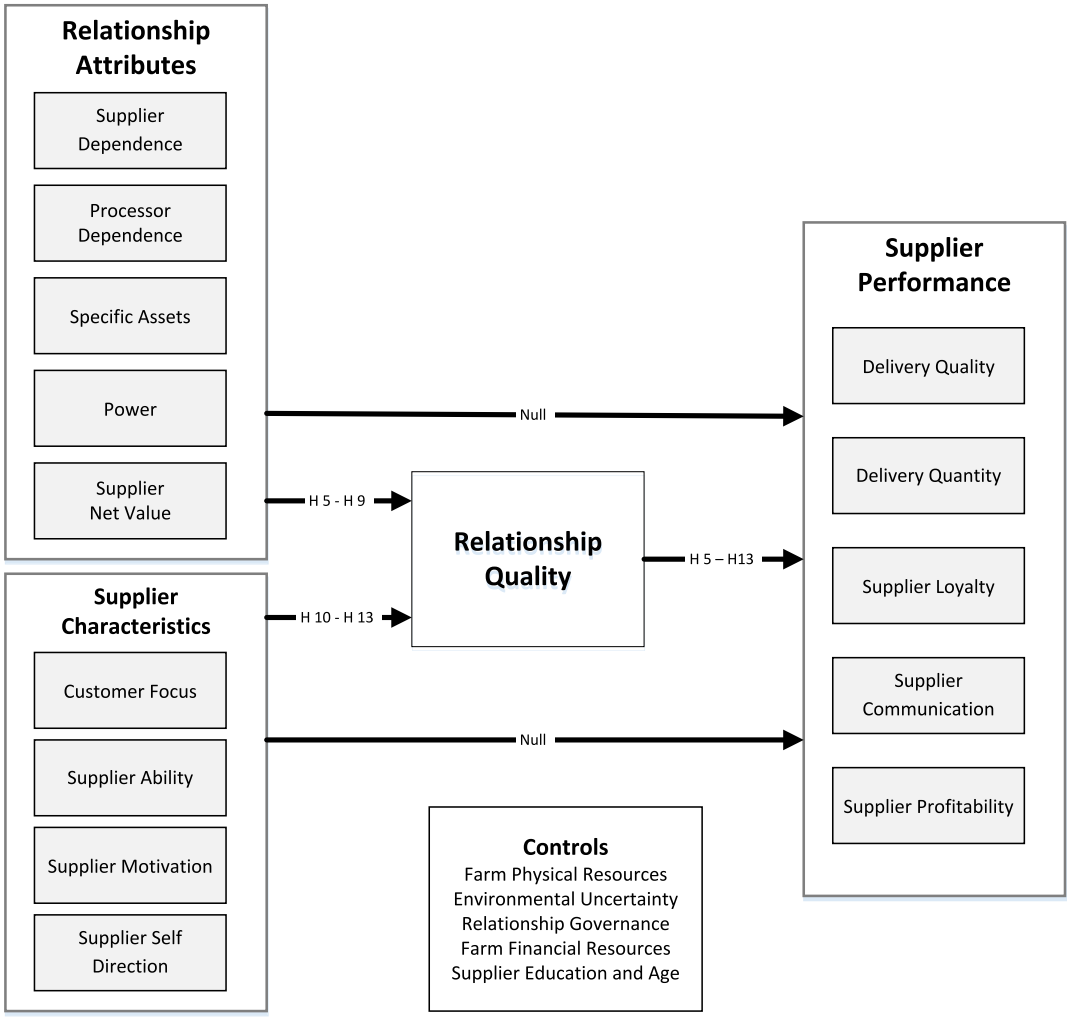

Figure 3-9: Theoretical model with hypotheses to be tested

The theoretical model (Figure 3-9) proposes that the effect of supplier characteristics and relationship attributes on supplier performance is mediated by relationship quality. This combined with the relationship quality models described in Figure 3-5 - Figure 3-8 generate the hypotheses outlined in Table 3-1. For simplicity, in Figure 3-9 the relationship between each of the dependent and independent variables were not drawn. However, the hypotheses evaluate the effect of each of the supplier characteristics and relationship attributes on both relationship quality and each of the supplier performance variables.

Table 3-1: Hypotheses proposed based on theoretical model

Hypotheses
H1a-g: Relationship quality is a construct with sub-dimensions of: Structural social capital, relational/cognitive social capital, trust, commitment, satisfaction with communication, satisfaction with price and satisfaction with the organisation.
H2a: Social capital and relationship quality are distinct constructs.
H2 b,c: Social capital made up of sub-dimensions of structural and relational/cognitive social capital.
H2g-1: Satisfaction is made up of sub-dimensions that include satisfaction with performance, communication and price.
H2d-i: Relationship quality made up of sub-dimensions of trust, commitment and satisfaction.
H3a-g: Relationship quality is a construct that consists of social capital, trust, commitment and satisfaction.
H4a-g: Social capital is a construct that consists of social relationship quality, trust, commitment and satisfaction.
H5a-e: Relationship quality mediates the positive effect of supplier dependence on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H6a-e: Relationship quality mediates the positive effect of processor dependence on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H7a-e: Relationship quality mediates the positive effect of specific assets on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H8a-e: Relationship quality mediates the negative effect of power on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H9a-e Relationship quality mediates the positive effect of supplier net value on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H10a-e: Relationship quality mediates the positive effect of customer focus on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H11a-e: Relationship quality mediates the positive effect of supplier ability on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H12a-e: Relationship quality mediates the positive effect of supplier motivation on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.
H13a-e: Relationship quality mediates the positive effect of supplier self-direction on delivery quality, delivery quantity, supplier loyalty, supplier communication and supplier profitability.

The main hypothesis theorises that the effects of supplier characteristics and relationship attributes on supplier performance are fully mediated by relationship quality (Figure 3-3). This would mean that relationship quality is a necessary condition for both supplier characteristics and relationship attributes to effect supplier performance. The alternative model proposes that relationship quality is not a mediating variable and therefore there are only direct effects between these variables and supplier performance. Structural equation modelling will test both these models. The mediated model is described diagrammatically in Figure 3-10. This shows the nine primary hypotheses, H5 – H13, and the five sub-hypotheses (a-e). This results in 45 individual hypotheses for the mediated model; including the alternative direct effects model where there were 90 separate relationships to be tested. This demonstrates the power of structural equation modelling as a technique for simultaneously evaluating a large number of variables. The potential complexity of this does require a careful description of the results and the conclusions drawn from the analyses.

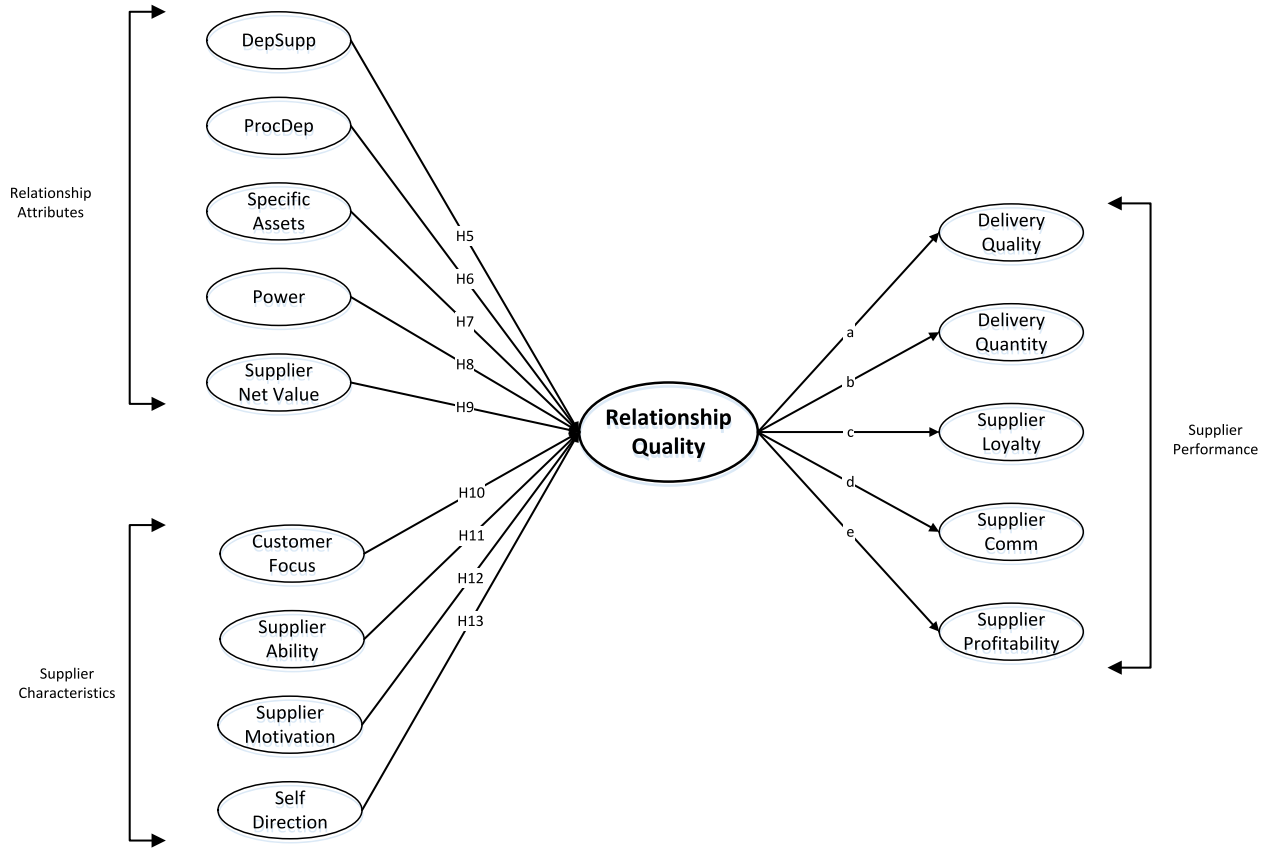

Figure 3-10: Mediated model hypotheses

Chapter 4: Measures and constructs

4.1 Introduction

This chapter, describes the theoretical constructs (and variables) that are contained in the theoretical model (Figure 3-4) and used in the survey instrument to collect the quantitative data. For each construct, the different definitions described in the literature are discussed in order to develop a common definition. These were then developed into scale items used to create the survey instrument (see section 5.4.1). The scale items were developed following the procedure of (Churchill, 1979). The survey instrument utilised mostly five point Likert scales, ranging from strongly agree to strongly disagree, to measure each scale item. Some other Likert scales used in the survey had measurements ranging from very satisfied to very dissatisfied, extremely important to not at all important, very good to poor and much higher to much lower. The scale items are described under the main theoretical constructs outlined in Figure 4-1

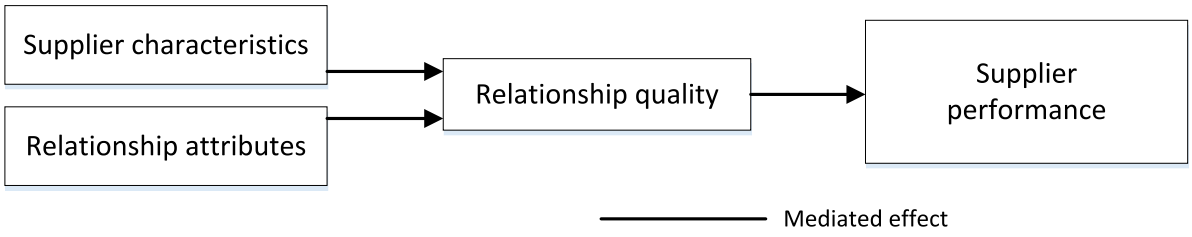

Figure 4-1: Theoretical model and with constructs

4.2 Relationship attributes

This section defines the constructs representing the relationship attributes that influence relationship quality. These include relationship net value, power, dependence and specific assets. As mentioned in section 4.4, relationship attributes are distinct from relationship quality in that they measure the structure and characteristics of the relationships rather than measuring the quality of the relationship

4.2.1 Supplier net value - benefits, costs and risks

Supplier net value represents some of the non-economic benefits and costs experienced by the supplier as a result of the relationship. Ulaga and Eggert (2005) identified common aspects of relationship value from the literature. These included its conceptualisation as a trade-off between benefits and sacrifices (costs) and that these were multifaceted and relative/related to competition. They also identified these as a cognitive construct involving

a rational evaluation of the benefits and costs of the relationship. Villena et al. (2011) identify that these costs and benefits were both operational, such as price as well as strategic, and included such things as access to premium markets and access to technical expertise. The scale items used for supplier value (Table 4-1 and Table 4-2) were adapted from Ulaga and Eggert (2005) and Villena et al. (2011)

Table 4-1: Scale items for supplier value - costs and risks

Dimension	Code	Description
Cost/benefit	SuppCost1_Risk	The costs and risks involved in supplying [processor] are greater than the benefits (Ulaga & Eggert, 2006).
Compared with alternative options, supplying our [processor] has enabled us to:		
Flexibility	SuppCost2_Flex	Reduced flexibility in our farming operation (Villena et al., 2011).
Cost risk	SuppCost3_Incr	Increased production costs (Villena et al., 2011).
Stress	SuppCost4_Stress	Extra management effort stress (Ulaga & Eggert, 2006).
Production risk	SuppCost7_ProdRisk	Increased production risk on our farm (production uncertainty).
Financial risk	SuppCost5_LessProfit	Reduced farm profitability (Ulaga & Eggert, 2006).
Price risk	SuppCost6_MktRisk	Increased market risk involved in selling our [PRODUCT] (price uncertainty).
These items were measured using a 6 point Likert scale ranging from: *Strongly agree* to *strongly disagree*.		

Table 4-2: Scale items for supplier value - benefits

Dimension	Code	Description
	Compared with alternative options, supplying our [processor] has enabled us to:	
Business growth	Value1_GrowBus	Grow our farming business.
Premium markets	Value2_Premium	Access premium markets for our farm products (Villena et al., 2011).
Access to technologies	Value3_NewTech	Adopt new technologies into our farming system (genetics, crops etc.) (Villena et al., 2011).
Customer adaptation	Value4_Customer	Adapt our production to meet the requirements of customers for our products (Villena et al., 2011).
Costs reduction	Value5_ReduceCost	Reduce our costs of production (Villena et al., 2011).
Financial benefits	Value6_Profit	Increase our farm profitability (Ulaga & Eggert, 2006).
Risk reduction	Value7_ProdRisk	Reduce the production risk on our farm (production uncertainty).
Price risk reduction	Value8_MktRisk	Reduce the market risk involved in selling our [product] (price uncertainty).
These items were measured using a 6 point Likert scale ranging from: *Strongly agree* to *strongly disagree*.		

4.2.2 Power

Power is an important variable in exchange relationships with the terms power and control often used interchangeably (Anderson & Narus, 1984). There is considerable evidence that an imbalance in the power balance between exchange partners results in inequality in exchange benefits (Molm, 1997). Power is a multi-dimensional construct generally recognised as being either coercive or non-coercive in nature (Ireland & Webb, 2007). Coercive power involves the ability to inflict negative outcomes through punishment or threats of sanctions, and non-coercive power is the ability to provide rewards (Molm, 1997). Sources of power have also been categorised as mediated and unmediated (Table 4-3). On the one hand, mediated power sources are specifically administered or threatened by an

agent, whereas non-mediated sources are not directly administered by the agent but naturally exist in business relationships independent of specific actions. Mediated power sources, for example, include reward, coercive and legal legitimate (Maloni & Benton, 2000). These mediated bases of power represent the competitive and negative uses of the power traditionally associated with organisational theory. On the other hand, non-mediated power sources are more positive in orientation and they include expert, referent, and legitimate power (Benton & Maloni, 2005; Brown, Lusch, & Nicholson, 1995; Maloni & Benton, 2000). The use of coercive power has a negative effect on relationship quality and, in particular, on the levels of commitment. (Brown et al., 1995).

Table 4-3: Bases and types of power in exchange relationships

Type of Power	Power base	Description	Exchange relationship example
Mediated	Reward	Buyer has ability to mediate rewards to supplier.	Buyer can give increased business to supplier or preferential terms.
	Coercive	Buyer has the ability to mediate punishment to supplier.	Buyer can cancel business or reduce volume purchased.
Non-mediated	Expert	Buyer has knowledge, expertise or skills desired by the supplier.	The buyer knows what the customer wants or has knowledge or expertise in designing or distributing new products to final customers.
	Referent	Supplier values identification with the customer.	Supplier wants to be associated with the buyer due to organisational culture, business success or management style.
	Legitimate	The supplier believes the buyer has a natural right to influence.	Supplier views itself as a subsidiary or subservient to the buyer due to the supplier/buyer relationship and therefore has the right to expect things done according to its requirements.
	Legal legitimate	Buyer has the judiciary right to influence supplier.	Supplier and buyer have a formal sales contract or operate as a legal entity.

Adapted from Maloni and Benton (2000) and (Zhao et al., 2008)

The scale items were selected to represent mediated power, which include both reward power and coercive power. The processor-mediated power scale (Table 4-4) was adapted from Brown et al. (1995).

Table 4-4: Scale items for processor-mediated power

Dimension	Code	Description
Reward power	Power1_Treat	If we did not do what our processor asked we would not have received very good treatment from them (Brown et al., 1995).
Reward power	Power2_Favour	We felt that by going along with what our processor asked, we would have been favoured on other occasions (Brown et al., 1995).
Coercive power	Power3_Profit	Our processor has hinted that they would take certain action that would affect our profitability if we did not go along with their requests (Brown et al., 1995).
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.2.3 Specific assets

Specific assets are those that are of limited use in alternative supply relationships. These include physical assets, site assets, human assets and other dedicated assets (Williamson, 1979). The dilemma with specific assets is that efficient production requires investment in physical and human assets. Customising and developing specific assets enable firms to reduce production costs, meet product specifications, innovate and produce differentiated products (Dyer, 1996; Ebers & Semrau, 2015). However, it also results in dependence and this creates the potential for opportunistic behaviour. The scale items for specific investments (Table 4-5) were adapted from Ebers and Semrau (2015).

Table 4-5: Scale items for specific assets

Dimension	Code	Description
Investments	SpecInv1_Reqs	We have made significant investments in our farm business in order to specifically meet the requirements of our processor (Kumar et al., 1995).
Knowledge	SpecInv2_Know	There has been a significant amount of specific knowledge we have had to learn in order to specifically meet the requirements of supplying our processor.
Modification	SpecInv3_Modify	We have made significant modifications our farming system specifically to meet the requirements of supplying the our processor (Kumar et al., 1995).
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.2.4 Dependence

Dependence is a central concept in buyer-seller exchange relationships (Andaleeb, 1995). It is defined as the extent to which partners need each other to achieve their goals. Critical to dependence is the importance of the resources provided by another party and the number of alternatives available. Dependence and commitment are positively correlated. If the supplier is highly dependent, he may continue to maintain the relationship and remain committed no matter which kind of influence strategy is used (Andaleeb, 1995; Ghijsen, Semeijn, & Ernstson, 2010). The scale items for dependence (Table 4-6 and Table 4-7) were adapted from Ghijsen et al. (2010).

Table 4-6: Scale items for buyer dependence

Code	Description
ProcDepend1	Our current our processor is more dependent on us than we are on them.
ProcDepend2	Regarding your [processor]: Our [processor] is very dependent on us.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.	

Table 4-7: Scale items for supplier dependence

Code	Description
SuppDepend1	As a business, we feel very dependent on our [processor].
SuppDepend2	We are more dependent on current our processor than they are on us.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.	

Table 4-8 presents descriptive variables that were used in the analysis and provided an alternative measure of dependence to the scale items.

Table 4-8: Descriptive variables for supplier dependence

Code	Description
SuppDep%_Inc	Approximately what % of your total farm income comes from your [processor]?
SuppOptions	How many other companies are there in your area that you could potentially supply your [product] to?

4.3 Supplier characteristics

Supplier characteristics represent specific attributes that suppliers have that may influence relationship quality and/or supplier performance (Figure 3-4).

4.3.1 Customer focus

Suppliers are considered to be customer-oriented when they perform behaviours with the goal of increasing long-term customer satisfaction (Dorsch et al., 1998). The scale items in Table 4-9 were adapted from Narver, Slater, and MacLachlan (2004).

Table 4-9: Scale items for supplier customer focus

Dimension	Code	Description
Customer needs	Customer9_Underst	We try to understand customers to recognise their needs months or even years before the majority of the market may recognise them (Narver et al., 2004).
	Customer1_Needs	We continually try to understand the needs of our customers even ones of which they are unaware (Narver et al., 2004).
	Customer2_Soln	We try incorporate solutions to future customer needs into to farming operation.
Customer adaptation	Customer3_Mod	We are willing to modify our production practices to meet customer requirements even if it increases our costs.
	Customer7_Reqs	We have made significant changes to our farming operation to better meet customer requirements.
Customer connection	Customer4_know	It is important for me to know who the customer of our [product] is.
Market innovation	Customer5_Inn_Mkt	We are always looking for innovative ways to market our products
Product differentiation	Customer8_Diff	We are always looking for ways to differentiate our farm products and gain a premium price.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.3.2 Supplier motivation

Motivation is an important aspect of supplier capability. Suppliers may possess significant abilities that can be used to meet customers' needs; however, unless they are motivated to achieve this they are unlikely to deliver to the buyers' specifications. Supplier motivation is defined as the willingness to exert high levels of effort to enhance performance and develop long-term relationships (Sang Chin, Yeung, & Fai Pun, 2006). There were no existing scales for supplier motivation in the agri-food industry. Therefore the scale items were developed following the procedure of (Churchill, 1979). These items focused on motivation to improve farm performance and stock quality.

Table 4-10: scale items for supplier motivation

Dimension	Code	Description
Farm	SuppPerF1_Farm	We continually strive to improve our farm performance.
Quality stock	SuppPerF2_QLStock	We continually strive to improve the quality of our stock.
	SuppPerF5_NoPremium	We would aim to produce the best quality stock even if we were not able to get a premium for it.
Animal production	SuppPerF3_Yield	We continually try to improve our farm performance by improving yields (animal production).
Efficiency	SuppPerF6_Effic	We have consistently managed to improve our farm efficiency
Higher market returns	SuppPerF7_ImpReturns	Regarding you and your farm business? We continually try to improve our farm performance by achieving higher market returns for our products.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.3.3 Supplier ability

Supplier ability is very context specific and is relative to the ability of other suppliers. Farming is also a practical enterprise that involves considerable tacit knowledge. Supplier ability scales was developed to cover specific ability outcomes for delivery of stock numbers when required, improving farm efficiency, and implementation of new technology. They were also required to self-assess their overall farm management ability. Though self-assessment of these scale items by individual farmers is likely to produce inflated values the relative values are likely to produce consistent differences in ability.

Code	Description
SuppAbil1_Qual	Compared to other farmers how would you rate your ability to deliver the numbers of stock when required.
SuppAbil2_Mgmt	Compared to other farmers how would you rate your overall farm management skills.
SuppSuppAbil3_Eff	Compared to other farmers how would you rate your ability to reduce production costs and increase farm efficiency.
SuppAbil4_Inn	Compared to other farmers how would you rate your ability to implement innovation and new technology.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.	

4.3.4 Self-direction

The concept of self-direction is derived from the work of Schwartz (1992) who describes ten universal values which include: power, achievement, hedonism, universalism, benevolence, self-direction, tradition, conformity and security. Schwartz and Bilsky (1990) define self-direction as independent thought and action involving choosing, creating and exploring. In this way, self-directed suppliers have independent thought and action and have a greater sense of mastery and control over their destiny. Self-direction is similar to the concept of

internal locus of control. People with an internal locus of control attribute causality to themselves, and believe they have agency over circumstances (Albert & Dahling, 2016; Lefcourt, 2014). The scale items for self-direction are shown in Table 4-11

Table 4-11: Scale items for supplier self-direction

Code	Description
SelfDirect1_ProfitR	The reverse of: the main things that affect our farm profitability are outside of my control (eg weather, price).
SelfDirect2_ProdR	The reverse of: the years when the farm has shown poor production or profit have been due to circumstance totally out of my control.
SelfDirect3_ConstrR	The reverse of: there is little room to make improvements in our farm operation due to natural production constraints.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.	

4.4 Relationship quality factors

This section defines each of the three dimensions of relationship quality: trust, commitment and satisfaction. Relationship quality is distinct from relationship attributes (see section 4.2). Relationship quality reflects the overall strength and quality of a relationship, whereas relationship attributes describe specific characteristic such as dependence and power that contribute to relationship quality.

4.4.1 Trust

Trust is the most researched aspect of relationship quality and is frequently used as the central construct to assess the quality of buyer-supplier relationships. It is recognised as a important factor that decreases uncertainty in exchange relationships (Geyskens et al., 1996; Morgan & Hunt, 1994). Despite this, there is no agreed definition of trust. It is understood to be a complex, multi-dimensional construct. The various aspects of trust described in the literature are:

1. Contractual trust, competence trust and goodwill trust (Sako, 1992).
2. Trust in a partner and trust in a situation (Ireland & Webb, 2007).
3. Narrow scope trust (interpersonal and firm specific trust) and broad scope trust, which includes system and generalised trust (Grayson, Johnson, & Chen, 2008).
4. Process, characteristic and institution based trust (Zucker, 1986).
5. Real trust and credible commitments/substitutes for trust (Williamson, 1995).

This complex and inconsistent taxonomy makes research on trust in exchange relationships difficult. Nevertheless, within these definitions two distinctive aspects of trust are described (see Table 4-12). These are what Grayson et al. (2008) calls “narrow scope trust”, which includes interpersonal and firm specific trust, and “broad scope trust”, which includes

system and generalised trust. Broad based trust is trust in the social context in which the relationship takes place. Narrow scope trust refers to specific trust in an individual firm and their representatives (Grayson et al., 2008). This contains the character and competence dimensions of trust, which include goodwill, benevolence, honesty, reliability, integrity and delivery to promise. Under broad-based trust Grayson et al. (2008, p. 242) describe "generalised trust", which refers to trust in people and the tendency to trust all members of a social system regardless of sector or context. This reflects societal beliefs about relationship norms and is learned through multiple interactions over time. The important relationship between the two types of trust is that broad-based trust supports the formation of competence and goodwill trust in relationships. A significant feature of goodwill trust is that it only develops in long-term relationships through repeated exchanges (Ireland & Webb, 2007). This research focuses on narrow-based trust (Table 4-13). This is because broad-scope trust is a more generalised form of trust provided by a social system and does not have the interpersonal aspects of trust relevant to exchange relationships.

Table 4-12: Types of trust: Broad scope and narrow scope

Broad scope trust, (Grayson et al., 2008)		
Reference	**Type of trust**	**Description**
(Ireland & Webb, 2007)	Trust in a situation	Reliance on a partner because the transaction facilitates efforts to achieve efficiency goals and the expected benefits of the transaction. This exceeds the expected costs.
(Zucker, 1986)	Institution-based trust	Tied to formal societal structures, based on individual or firm-specific attributes or on intermediary mechanisms.
(Williamson, 1995)	Credible commitments (substitutes for trust)	Use of contracts, bonds, hostages, information disclosure rules and specialised dispute settlements.
(Sako, 1992)	Contractual trust	Will the other party carry out Its contractual agreement, and "goodwill trust" (Will the other party make an open-ended commitment to take initiatives for mutual benefit while refraining from taking unfair advantage?
Grayson et al., 2008)	System trust	The belief that third parties will publicise or impose punishments on untrustworthy behaviour.
Grayson et al., 2008)	Generalised trust	Trust in all members of a social system based on beliefs about relationship norms learned through multiple interactions over time that means.
Narrow scope trust		
Grayson et al., 2008)	Interpersonal trust	Trust that in individual relationship partner through the process of information gathering over time.
Grayson et al., 2008)	Firm-specific trust	Trust in an organisational relationship partner through the process of information gathering over time.
(Ireland & Webb, 2007)	Trust in a partner	Where partners willingly exceed the minimum requirements of a relationship to increase the likelihood of success for all partners.
(Zucker, 1986),	Process-based trust	Based on past or expected exchange.
(Zucker, 1986),	Characteristic trust	Based on a person, and on social characteristics.
(Sako, 1992)	Competence trust	That the other party capable of doing what it says it will do.
(Sako, 1992)	Goodwill trust	That the other party make an open-ended commitment to take initiatives for mutual benefit while refraining from taking unfair advantage.

Table 4-13: Definitions of trust: Narrow based

Narrow scope trust, (Grayson et al., 2008)		
Reference	**Type of trust**	**Description**
(Blau, 1964)	"The belief that a party's word or promise is reliable and a party will fulfil his/her obligations in an exchange relationship" (p. 940).	Reliability, performance to promise
(Zand, 1972)	"Actions that (a) increase one's vulnerability, (b) to another whose behaviour is not under one's control, (c) in a situation in which the penalty (disutility) one suffers if the other abuses that vulnerability is greater than the benefit (utility) one gains if the other does not abuse that vulnerability" (p.230).	Vulnerability
(Zucker, 1986)	A set of expectations shared by all those involved in the exchange (p. 54)	Shared expectations
(Gambetta, 1988)	"The probability that a person with whom we are in contact will perform an action that is beneficial or at least not detrimental is high enough for us to consider engaging in some form of cooperation with him" (p. 217).	Expectation of benefit
(Bradach & Eccles, 1989)	"Expectation that one's exchange partner will not act opportunistically" (p. 104).	Non-exploitation
(Mishra & Morrissey, 1990)	"One party's willingness to be vulnerable to another party based on the belief that the latter party is: (a) competent; (b) open; (c) concerned; and (d) reliable" (p. 265).	Vulnerability, competence, reliability, concern, openness
(Anderson & Narus, 1990)	"Belief that another company will perform actions that will result in positive outcomes for the firm as well as not take unexpected that would result in negative outcomes" (p. 45).	Performance to promise, non- exploitation
(Sako, 1992)	"A state of mind, an expectation held by an economic agent about another, that the other behaves or responds in a predictable and mutually acceptable manner" (p.39).	Predictable, mutually acceptable behaviour
(Moorman, Deshpandé, & Zaltman, 1993)	"A willingness to rely on an exchange partner in whom one has confidence" (p. 23).	Confidence, reliability
(Barney & Hansen, 1994)	"The mutual confidence that no party to the exchange will exploit another's vulnerabilities" (p.176).	Confidence, vulnerability, non- exploitation
(Morgan & Hunt, 1994)	"When one party has confidence in an exchange partner's reliability and integrity" (p. 23).	Confidence, reliability, integrity
(Mayer, Davis, & Schoorman, 1995)	"The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (p. 712).	Vulnerability, performance to promise
(Ring & van de Ven, 1992)	"The perceived credibility and benevolence of a target of trust. Expectancy that the partner's word or written statement can be relied on. One partner is genuinely interested in the other partner's welfare and motivated to seek joint gain" (p. 488).	Credibility, benevolence, goodwill
(Rousseau, Sitkin, Burt, & Camerer, 1998)	"Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviours of another" (p. 395).	Vulnerability, positive expectation
(Geyskens, Steenkamp, & Kumar, 1998)	"The extent to which a firm believes that its exchange partner is honest and or benevolent" (p. 225).	Honesty, benevolence
(Bhattacharya, Devinney, & Pillutla, 1998)	"Trust is an expectancy of positive (or nonnegative) outcomes that one can receive based on the expected action of another party in an interaction characterized by uncertainty" (p. 462).	Uncertainty, positive expectation
(Rousseau et al., 1998)	"The expectation that an actor (1) can be relied on to fulfil obligations, (2) will behave in a predictable manner, and (3) will act and negotiate fairly when the possibility for opportunism is present" (p. 395).	Predictability, reliability, fairness
(Doney & Cannon, 1997)	"Confidence that the other party in the exchange relationship will not exploit its vulnerabilities" (p. 36).	Non-exploitation, vulnerability
(Zaheer et al., 1998)	"A decision to rely on another joint venture party under a condition of risk" (p. 43)	Reliance, Risk
(Dyer & Chu, 2003)	"The expectation that a partner intends to fulfil their role in the relationship. Expectation that partners have the ability to fulfil their roles" (p.58).	Reliability, competence
(Inkpen & Currall, 2004)	"The expectation held by one firm that another will not exploit its vulnerabilities when faced with the opportunity to do so" (p. 588).	Vulnerability, non-exploitation
(Lui & Ngo, 2004)	"Decision to rely on a partner with the expectation that the partner will act according to a common agreement. Belief that a given partner has the managerial and technical capabilities to properly perform a given set of tasks" (p. 474).	Competence, goodwill, reliability
(Krishnan, Martin, & Noorderhaven, 2006)	"Belief in the other party being honest, dependable or reliable and, second, the belief that the other party would not take advantage of an opportunity to gain at the other party's expense, given the chance" (p. 895).	Honesty, dependability, reliability, non-exploitation
(Sako, 2006)	"Trust is an expectation held by an agent that its trading partner will behave in a mutually acceptable manner (Including an expectation that neither party will exploit the other's vulnerabilities" (p. 3).	Goodwill, competence, performance to expectations, vulnerability
(Ireland & Webb, 2007)	"A psychological state where a party is willingly vulnerable to the behaviour of another party because of expected cooperation or benevolence from that other party" (p. 484).	Vulnerability, cooperation, benevolence
(Gattiker, Huang, & Schwarz, 2007)	"Belief that an exchange partner is benevolent and honest" (p. 5).	Benevolence, honesty
(McCarter & Northcraft, 2007)	"A type of expectation that one's exchange partner will not act opportunistically even when it is not possible to monitor that partner" (p. 501).	Non-exploitation
(Grayson et al., 2008)	"Belief that an exchange partner is benevolent and honest" (p.242)	Benevolence, honesty
(Puranam & Vanneste, 2009)	"Expectation that an exchange partner will not behave opportunistically, even when such behaviour cannot be detected by the victim" (p.11).	Non-exploitation
(Hill, Eckerd, Wilson, & Greer, 2009)	"Consists of two distinct measures benevolence and dependability" (p. 285).	Benevolence, dependability
(Nyaga, Whipple, & Lynch, 2010)	"Trust refers to the extent to which relationship partners perceive each other as credible and benevolent" (p. 104).	Credibility, benevolence
(Day et al., 2013)	"A function of credibility and benevolence. Trust is the confidence that each party in a relationship will perform as promised and genuinely take each other's welfare into consideration as each makes decisions" (p. 153).	Credibility, benevolence

Table 4-13 provides a summary of the various definitions of narrow-based trust described in the literature. These cover a wide variety of concepts, with reliability, performance to promise, credibility, benevolence, honesty and goodwill being the most common. Following this review of the different descriptions of trust (Table 4-13) the research builds on the original definition of Blau (1964, p. 940) for interpersonal, and firm specific trust which is "the belief that a party's word or promise is reliable and a party will fulfil his/her obligations in an exchange relationship".

This definition incorporates the dimensions relating to credibility, honesty and competence as well as benevolence or goodwill (Mishra, 1996; Nahapiet & Ghoshal, 1998). Credibility and competence refer to the belief that the other party has the ability to perform the required task effectively and efficiently; and benevolence, goodwill and honesty means they can trust their intentions and motivations (Ganesan, 1994). Benevolence implies the belief that each partner will act in the best interest of the other. This also includes the expectation that the other party will not take advantage of the others' vulnerability or dependence and will behave in a way that is honest, sincere and fair (Dwyer et al., 1987; Sako, 1992). Benevolence is also the extent to which one partner is genuinely interested in the other party's welfare and is motivated to seek joint gains. This means partners can rely on one another despite an ongoing potential for opportunistic behaviour (Handfield & Bechtel, 2002). In fact, Barney and Hansen (1994) define trust as the opposite of opportunism. Risk and vulnerability are important aspects of narrow scope trust, as highlighted by Rousseau et al. (1998, p. 395), who define trust as a "psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another". Furthermore, Granovetter (1985) identifies that "trust engendered by personal relations presents, by its very existence, enhanced opportunity for malfeasance" (p. 491). These definitions of trust provided the basis for developing the scale items for measuring trust as a latent variable. The scale items were adapted from (Anderson & Weitz, 1992; Kumar et al., 1995; Sako & Helper, 1998; Tsai & Ghoshal, 1998). These items were selected to cover the three dimensions of trust, which included honesty, benevolence and goodwill, as well as competence (Table 4-14).

Table 4-14: Scale items for trust

Dimension	Code	Description
Honesty	Trust1_Expl	Even if our processor gives us a rather unlikely explanation we are confident that they are telling the truth (Kumar, Scheer, & Steenkamp, 1995).
	Trust8_HonComm	Communications from our [processor] are open and honest.
	Trust9_InformComm	I feel informed about the organisation and the activities of [processor].
Benevolence /Goodwill	Trust2_Welfare	When making important decisions, our [processor] is always concerned about our welfare (Anderson & Weitz, 1992; Kumar et al., 1995).
	Trust3_Agree	We can rely on our processor to help us in ways not required by our agreement with them (Sako & Helper, 1998).
	Trust4_Fair	We believe that our processor will always treat us fairly (Sako & Helper, 1998).
	Trust5_Advantage	We can rely on our processor without any fear they will take advantage of us even if the opportunity arises (Tsai & Ghoshal, 1998).
Trust - competence	Trust6_Returns	We can rely on our processor to always deliver the best returns from the market.
These items were measured using a 6 point Likert scale ranging from: *Strongly agree* to *strongly disagree*.		

The literature provides extensive evidence of the benefits of this form of trust. It reduces transaction costs by reducing the need for contractual governance and provides greater flexibility in dealing with unforeseen circumstances, while providing benefits to both parties (Dyer & Chu, 2003; Ganesan, 1994; Ireland & Webb, 2007). It can also increase performance regardless of the governance mode (Gulati & Nickerson, 2008). Furthermore, trusting relationships are a valuable resource which are "difficult to imitate due to the socially complex and rare nature of trust. Thus, the parties of the relationship can gain competitive advantage" through developing trust (Laaksonen et al., 2009, p. 86). Trust can be costly and difficult to achieve but is an essential foundation for collaboration and can increase information sharing, inter-firm learning, joint problem solving and shared planning (Day et al., 2013; Fawcett, Jones, & Fawcett, 2012; Gulati & Singh, 1998; Ireland & Webb, 2007; Palmatier, Dant, & Grewal, 2007).

4.4.2 Commitment

Similar to trust, commitment is consistently understood to be an essential indicator of relationship quality and reflects the positive value of the relationship (Geyskens et al., 1998). It is considered a measure of the desire for the relationship to continue and the willingness to make an effort on the other party's behalf. This comes through in the definition of Geyskens, Steenkamp, and Kumar (1999), who define commitment as a "desire to continue the relationship in the future and a willingness to make short-term sacrifices to maintain the relationship" (p. 225). Based on this definition, relationship commitment involves an expectation that the relationship will continue, and with the desire to maintain and strengthen the relationship. This implies more than just a short-term evaluation of benefits

and costs. It reflects a willingness to invest financial, physical or relational resources in a relationship and make short-term sacrifices to achieve long-term benefits (Geyskens et al., 1998; Morgan & Hunt, 1994; Wilson, 1995).

In addition to these descriptions, the literature recognises a range other definitions of commitment (Table 4-15). Early research on commitment in exchange relationships tended to use a one-dimensional measure of the construct (Anderson & Weitz, 1992, p. 19). This is no longer the case, as commitment is now recognised as a multi-dimensional construct (Geyskens et al., 1996). Mowday, Steers, and Porter (1979) identified that organisational commitment had both an attitudinal and behavioural component. The attitudinal component "represents a state in which an individual identifies with a particular organisation and its goals and wishes to maintain membership in order to facilitate these goals" (Mowday et al., 1979, p. 225). The behavioural aspects relate to behaviours that exceed formal or normal expectations. This multi-dimensional definition is explained by Mowday et al. (1979, p. 225) as being "predicated on three independent foundations compliance or instrumental involvement for specific extrinsic rewards, identification or involvement based on a desire for affiliation and internalisation or involvement predicated on congruence between individual and organisational values" (p. 225). This was later refined into two dimensions to reflect an affective and calculative component (Dwyer et al., 1987; Ghijsen et al., 2010; Hunt & Morgan, 1995; Jain et al., 2013; Moorman et al., 1993; Parasuraman et al., 1988; Wilson, 1995).

The affective aspect is also referred to as a normative commitment (Andaleeb, 1996; Anderson & Weitz, 1992; Geiger et al., 2012; Morgan & Hunt, 1994) and incorporates concepts of loyalty, commitment and the forsaking of alternatives (Bendapudi & Berry, 1997; Geyskens et al., 1996; Gundlach, Achrol, & Mentzer, 1995). This type of commitment is based on social and psychological attachment to an exchange partner based on feelings of identification, loyalty and affiliation (Brown et al., 1995). It reflects a desire to want to stay in the relationship. Calculative commitment or instrumental commitment, on the other hand, indicates a need to stay in the relationship (Gundlach et al., 1995, p. 79). It is based on pragmatic considerations that involve the instrumental evaluation of the benefits of staying against the costs of leaving (Geyskens et al., 1996; Gounaris, 2005). This may mean there are constraints to leaving, or a dependency on, the relationship (Geyskens et al., 1996). The distinction between these two types of commitment is important, however, as research shows that most relationships involve normative and calculative aspects. As explained by O'Reilly and Chatman (1986, p. 497), commitment can, "result from value congruence,

financial investments, effective reward and control systems, or a simple lack of opportunity to move".

Table 4-15: Definitions of commitment

Authors (s)	Definition	Dimensions
(O'Reilly & Chatman, 1986)	"The psychological attachment felt by the person for the organization; it will reflect the degree to which the individual internalises or adopts characteristics or perspectives of the organisation" (p. 493).	Internalisation, psychological attachment
(Dwyer, Schurr, and Oh 1987)	"An implicit or explicit pledge of relational continuity between exchange partners" (p. 19).	Pledge to continue
(Anderson & Weitz, 1992)	"A desire to develop a stable relationship, a willingness to make short-term sacrifices to maintain the relationship, and a confidence in the stability of the relationship" (p. 19).	Desire to develop, willingness to sacrifice
(Moorman, Zaltman, & Deshpande, 1992)	"As an enduring desire to maintain a valued relationship" (p. 316).	Desire to maintain
(Morgan & Hunt, 1994)	"An exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it; that is, the committed party believes the relationship is worth working on to ensure that it endures indefinitely" (p. 23).	Maximum effort, desire to maintain
(Gundlach et al., 1995)	"First, commitment is defined to possess an input or instrumental component, that is, an affirmative action taken by one party that creates a self-interest stake in the relationship and demonstrates something, more than a mere promise. Second, commitment includes an attitudinal component signifying an enduring intention by the parties to develop and maintain a stable long-term relationship Third, commitment is thought to embrace a temporal dimension, highlighting the fact that commitment means something only over the long term" (p. 79).	Input/instrumental – self-interest, attitudinal – desire to maintain, temporal
(Andaleeb, 1996)	"A willingness to make a greater investment in the relationship and a desire to continue the relationship" (p. 85).	Willingness to invest, desire to continue
(Geyskens et al., 1996)	"A channel member's intention to continue the relationship" (p.304).	Intention to continue
(Monczka, Petersen, Handfield, & Ragatz, 1998)	"The willingness of buyers and suppliers to exert effort on behalf of the relationship" (p. 557).	Exert effort
(Walter, Mueller, & Helfert, 2000)	"Three different dimensions: affective commitment describes a positive attitude towards the future existence of the relationship. Instrumental commitment is shown whenever some form of investment (time, other resources) in the relationship is made. Finally, the temporal dimension of commitment indicates that the relationship exists over time" (p.3).	Affective, instrumental, temporal
(Gustafsson, Johnson, & Roos, 2005)	"Two dimensions of relationship commitment: affective commitment and calculative, or continuance, commitment" (p. 211).	Affective, calculative continuance
(Fullerton, 2003)	"Affective commitment is rooted in identification, shared values, belongingness, dedication, and similarity […] Switching costs, dependence and lack of choice are at the core of the continuance commitment construct in marketing relationships" (p. 335).	Identification, shared values, belonging, dedication, switching costs, dependence, lack of choice
(Park, Lee, Lee, & Truex, 2012)	"A continued desire to maintain a relationship of value exchange and is a psychological state predisposing an organisation toward maintaining the relationship over long term" (p. 460).	
(Meyer & Allen, 1991)	Affective commitment addresses the idea of individuals 'wanting' to stay. Calculative commitment involves individuals feeling that they 'have' to stay; for example, perhaps they have a contract, perceive high switching costs, or feel there are no reasonable alternatives available. They are locked in (i.e., constraint based). Finally, normative commitment involves individuals feeling that they 'should'' stay in a relationship due to a moral or personal obligation, that is, based on social pressure.	Affective, calculative, normative

These definitions of commitment (Table 4-15) have some common features, including a willingness to invest, desire to continue and identification. These three dimensions were developed into the scale items to measure commitment as a latent variable. These focus on the affective aspects of commitment rather than calculative commitment. This is because

affective commitment reflects a partner's desire to stay in the relationship due to a sense of shared goals and belonging rather than they having to stay because of a calculative commitment. The calculative aspects are incorporated into the supplier dependence construct. The measurement items (Table 4-16) were adapted from (Kumar et al., 1995; Sako & Helper, 1998; Tsai & Ghoshal, 1998; Villena et al.)

Table 4-16: Commitment scale items

Dimension	Code	Description
Expectation of continuity	Commit1_RelLongTerm	We expect our relationship with our [processor] to continue for a long time (Sako & Helper, 1998).
Identification	Commit3_Proud	We are proud to tell other farmers that we are a supplier to our [processor].
Willingness to Invest	Commit2_Resources	We are willing to dedicate time, effort and resources to support our [processor] in growing their markets and sales (Tsai & Ghoshal, 1998).
Willingness to Invest	Commit4_LTInvest	We are willing to make long term investments and changes to our farm to better meet the requirements of our [processor] and their customers (Kumar et al., 1995; Villena et al.) .
These items were measured using a 6 point Likert scale ranging from *strongly agree* to *strongly disagree*.		

4.4.3 Satisfaction

Satisfaction is the third dimension of relationship quality used in this research. It is an important concept within exchange relationships and is a central tenant of relationship marketing, as well as channel and organisational research. Most definitions of satisfaction focus on an overall evaluation of the relationship (see Table 4-17). For example, Dwyer and Oh (1987) draw on the conceptualisation of Ruekert and Churchill Jr (1984, p. 227) who define satisfaction as the overall assessment of the characteristics of the relationship, which are "rewarding, profitable, instrumental and satisfying or frustrating, problematic, inhibiting, or unsatisfying". In this, way satisfaction is a summary psychological state that involves the evaluation of the past outcomes of the relationship (Andaleeb, 1996; Oliver, 2010). It is multi-dimensional and incorporates economic and non-economic psychological aspects including social interaction and financial performance as well as features of the service and assistance provided by the partner (Gassenheimer & Ramsey, 1994; Geyskens et al., 1999; Homburg & Rudolph, 2001; Ruekert & Churchill Jr, 1984). These aspects are evaluated in terms conformity or disconformity with expectations (Oliver, 2010; Parasuraman et al., 1988; Wilson, 1995). Scheer and Stern (1992), as well as Ulaga and Eggert (2006), specifically emphasise an overall positive evaluation and approval of the relationship performance against some comparison or standard. This standard can reflect different dimensions of the relationship; for example, Dwyer and Oh (1987) define satisfaction as "a feeling of equity

with the supply chain relationship no matter what power imbalances exist between/in the buyer–seller dyad". The economic evaluation includes evaluation of the financial rewards and considers such things as volume and margins and overall achievement of goals. The non-economic aspects relate to the how the parties relate on a personal level, that means they enjoy working together (Geyskens et al., 1999).

Table 4-17: Definitions of satisfaction

Author(s)	Definition	Dimensions
Ruekert and Churchill Jr (1984)	"Overall assessment of the characteristics of the relationship which are "rewarding, profitable, instrumental and satisfying or frustrating, problematic, inhibiting, or unsatisfying" (p. 227).	Overall appraisal of positive and negative
(Scheer & Stern, 1992)	"The overall approval of and positive affect towards another party" (p. 133).	Positive affective state
(Bendapudi & Berry, 1997)	"Positive affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm" (p. 2).	Positive affective state, overall appraisal
(Geyskens et al., 1999)	"As a positive affective state resulting from the appraisal of all aspects of a firm's working relationship" (p. 224).	Positive affective state, overall appraisal
(Benton & Maloni, 2005)	"A feeling of equity with the supply chain relationship no matter what Power imbalances exist between the buyer–seller dyad" (p. 2).	Feeling of equity
(Ulaga & Eggert, 2006)	"An affective state of mind resulting from the appraisal of all relevant aspects of the business relationships" (p. 316).	Affective state, overall appraisal

Table 4-17 identifies some common themes in the definition of satisfaction. These are a positive affective state based on an overall appraisal of the relationship. As this definition is still rather general, to operationalise the measurement of commitment it was necessary to identify existing scale items that could be adapted. Also, this generalised description of satisfaction is likely to be due to the fact that satisfaction tends to be context specific, and hence scale items were adapted to the context agri-food supply chains. The scale items were based on three dimensions of satisfaction, which included satisfaction with price, satisfaction with support and communication and satisfaction with the performance of the buyer. These items were adapted from Anderson and Weitz (1992); Kumar et al. (1995); Anderson and Narus (1984); Micheels and Gow (2011) and Nooteboom, Casson, and Godley (2000).

Table 4-18: Scale items for satisfaction

Dimension	Code	Description
Satisfaction with price		
Price Expectations	Satisf9_Returns	How would you rate the actual returns you achieve from supplying your [processor], compared to what you would expect to achieve for your animals (Anderson & Weitz, 1992)?
Price satisfaction	Satisf10_PriceStock	The returns we received for our stock were satisfactory last year (Anderson & Weitz, 1992; Kumar et al., 1995).
	Satisf4_Price	The price received for the animals you supply.
Price Structure	Satisf5_PriceSched	The seasonal structure of the pricing schedule.
Satisfaction with support and communication		
Supply manager	Satisf6_Support	The support provided by the stock buyer/supply manager.
Quantity	Satisf7_CommQuant	The quantity; (amount, frequency) of communication.
Timeliness	Satisf8_CommQual	The timeliness of communication.
Satisfaction with performance		
Net return	Satisf1_NetReturn	Net return to supplying stock (Anderson & Narus, 1984).
Support services	Satisf2_Support	Support services provided (Micheels & Gow, 2011).
Policies	Satisf3_Policies	Having reasonable policies (Anderson & Narus, 1984).
Processor competence	ProcAbil1_Mktg	Their marketing and sales skills (Anderson & Narus, 1984).
	ProcAbil2_SChain	Their skills for improving quality and efficiency in the supply chain (Anderson & Narus, 1984).
	ProcAbil3_Prem	Their ability to get a premium price from the market (Nooteboom, Casson, et al., 2000).
These items were measured using 6 point Likert scales that ranged from *very satisfied* to *very dissatisfied*, *much better* to *much worse* and *far short of expectations* to *far exceeds expectat*ions.		

4.4.4 Social capital

An important aspect of this research is to evaluate the difference between social capital and relationship quality constructs. Having described the three dimensions of relationship quality above it was, therefore, important to clearly define social capital. The literature at times represents social capital as a closely related concept to relationship quality, utilising a construct referred to as relational capital. Both SC and relationship quality represent valuable assets that can provide competitive advantage (Granovetter, 1992; Lawson et al., 2008). Social capital is defined by Carey, Lawson, and Krause (2011, p. 5). as the "sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit". This is consistent with most other definitions. While these definitions of social capital focus more on access to resources in the social network (Table 4-19), the measurements used for social capital are closely aligned to measurements of relationship quality. This may partly be due to the difficulty in measuring the resources in a network and then deciding which of them are available to the other parties in the network.

Table 4-19: Definitions of social capital

Author(s)	Definition
(Baker, 1990)	"A resource that actors derive from specific social structure and then use to pursue their interest" (p 619).
(Bourdieu & Wacquant, 1992)	"The sum of resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalised relationships of mutual acquaintance and recognition" (p 119).
(Burt, 1992)	"Friends colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital" (p 9).
(Knoke, 1999)	"The process by which social actors create and mobilise their network of connections within and between organisations to gain access to other social actor's resources" (p 18).
(Portes, 1998)	"The ability of actors to secure benefits by virtue of membership of social networks or other social structures" (p 6).
(Nahapiet & Ghoshal, 1998)	"The sum of actual and potential resources embedded within, available through and derived from a network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and assets that may be mobilised through the network" (p 243).
(Woolcock, 1998)	"The information, trust, and norms of reciprocity inhering in one's social networks" (p.153).

Nahapiet and Ghoshal (1998) propose three dimensions of social capital cognitive, structural and relational. The relational dimension is the most similar in conception to relationship quality. This is defined as the assets that are embedded in personal relationships developed with each other through a history of interactions, leading to relations of trust, obligation and reciprocity (Lawson et al., 2008). Kale, Singh, and Perlmutter (2000) define the relational dimension of social capital as close interpersonal interactions, trust, friendship, respect and reciprocity. This definition is close to the trust dimension of relationship quality. The structural dimension refers to the structural configuration, diversity, centrality and boundary-spanning roles of network participants (Carey et al., 2011; Lawson et al., 2008; Nahapiet & Ghoshal, 1998). The cognitive dimension incorporates the resources providing the parties with shared representations, interpretations and systems of meaning (Lawson et al., 2008). The current research is novel in that there have been few studies that focus on the suppliers' perspectives of social capital (Whipple, Wiedmer, & K. Boyer, 2015) and it is rare for studies to link social capital to relationship quality in exchange relationships. Based on the three dimensions, social capital was operationalised using ten scale items adapted from Villena et al. (2011) and Nooteboom, Casson, et al. (2000) incorporating cognitive, relational and structural social capital (Table 4-20).

Table 4-20: Scale items for social capital

Dimension	Code	Description
Cognitive		
Mutual goals and values	C.SocCap1_Goals	Having compatible goals and objectives (Nooteboom, Casson, et al., 2000).
	C.SocCap2_Values	Having similar values (Nooteboom, Casson, et al., 2000).
Relational		
Personal bonds	R.SocCap3_Bonds	Having strong personal bonds (Villena et al., 2011).
	R.SocCap4_Friend	Involving personal friendship between both parties (Villena et al., 2011).
	R.SocCap5_Friend	Involving a close personal interaction between both parties (Villena et al., 2011).
	R.SocCap6_Pers	Involving give and take (reciprocity) between both parties (Villena et al., 2011).
	R.SocCap7_Trust	Having strong mutual trust between both parties (Villena et al., 2011).
Structural		
Interaction	S.SocCap8_Funct	Interaction between different functions of staff in both businesses (technical, admin, marketing, etc.) (Villena et al., 2011).
	S.SocCap9_Level	Interaction between different levels of staff in both businesses (management, technical, admin) (Villena et al., 2011).
	S.SocCap10_Freq	Frequent and intensive interaction between both parties (Villena et al., 2011).
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

These scale items enabled social capital to be measured in a way that would establish if social capital and relationship quality were distinct or related constructs. As relationship quality and social capital are critical to this research, it was important to ensure that these scale items are clearly defined to ensure accurate measurement of the latent constructs. The following sections describe the remaining constructs and their measurement items.

4.4.5 Opportunism

Opportunism is an important concept in exchange relationships and has been a topic of much discussion. Williamson (1985) defines opportunism as "Self-interest seeking with guile" (p. 30). This definition specifically implies deceit and a violation of explicit or implicit promises about appropriate or required behaviour (John, 1984; MacNeil, 1980). Although opportunism has been used as a basis for many studies of inter-firm relationships (Anderson & Weitz, 1992; Dwyer & Oh, 1987; Heide & John, 1992; Maitland, Bryson, & Van de Ven, 1985), there is concern as to whether opportunism is a correct description of human behaviour (Wathne & Heide, 2000). Maitland et al. (1985) argue that it is important to distinguish between attitudes and behaviours, where attitudes represent an inclination or tendency not the actual behaviour. Furthermore, they recommend that opportunism should be treated as an attitudinal variable. This is because actual opportunistic behaviour is rare, as opposed to an inclination to opportunism, and therefore difficult to measure. Furthermore, opportunism has been identified as the inverse of trust (Barney & Hansen, 1994; Dorsch et al., 1998; Morgan & Hunt, 1994). This means that the perceived likelihood of

opportunism can be captured through measuring trust in the exchange partner. This enables the attitudinal aspect of opportunism to be captured. This is the approach taken in this research. It is assumed that the propensity for opportunistic behaviour is incorporated in the concept of trust, with lack of trust being highly correlated to the perceived risk of opportunistic behaviour. This is similar to the work of (Laaksonen et al., 2009) who that found that relationship quality was inversely related to opportunistic tendencies.

4.5 Supplier performance factors

Supplier performance is the dependent variable used in this study (Figure 3-4). There is considerable literature on the importance of relationship quality to improving supplier performance. Supplier performance came out the literature on supplier development (Dorsch et al., 1998), which describes the efforts of manufacturers to improve supplier performance. Supplier development is defined as any effort of a buying firm to increase the performance and/or capabilities of their suppliers to meet the buying firm's supply needs (Wilson, 1995). Supplier performance, therefore, is most often from the buyer's perspective and refers to a supplier's improvements in communication, product quality, delivery timing and reliability that benefits the buying firm (Laaksonen et al., 2009). As supplier performance is highly context specific, the supplier performance items were developed from the literature and refined from interviews with the buyers. The supplier performance items identified were communication, quality, reliability, loyalty and profitability. Each of these will be discussed in the following section with the scale items developed. The performance items used in this research were delivery quality, delivery quantity, loyalty, communication and profitability.

4.5.1 Cooperation

Cooperation is often used as an evaluation of supplier performance. Anderson and Narus (1990, p. 45) define cooperation as "similar or complementary coordinated actions taken by firms in interdependent relationships to achieve mutual outcomes or singular outcomes with expected reciprocation over time". This means that firms work together to achieve mutual goals (Morgan & Hunt, 1994) and that the actual cooperative behaviours will depend on the specific outcomes desired by each party. This makes measuring cooperation as an independent construct problematic as it becomes highly context specific. Therefore, the approach taken with this research was to focus on context specific supplier performance outcomes desired by the buyer/processor. This assumes that these are outcomes and objectives required by the buyer and, therefore, they define what the buyer might consider

cooperative behaviours. In this way, cooperation is not included as a latent construct but is assumed to be captured in the specific supplier performance constructs. These include communication, loyalty and delivery quality and quantity.

4.5.2 Supplier communication

The first of the supplier performance outcomes is communication and information sharing, which are important aspects of cooperative behaviour and supplier performance. Anderson and Narus (1990, p. 44) defined communication as "the formal as well as informal sharing of meaningful and timely information between firms". Effective supplier communication (as well as buyer communication) is an essential coordinating activity in food supply chains and is critical to the overall supply chain performance. Information from suppliers enables firms to respond to customers' needs, reduce inventory costs and improve competitive advantage (Stank, Crum, & Arango, 1999). In agri-food supply chains, production volume, timing and quality, can be highly variable and affected by environmental factors as well as management decisions. The effective flow of production information from suppliers can benefit buyers through reduced variation and sorting costs and better ability to meet customer requirements (Micheels & Gow, 2011). The supplier communication scale items (Table 4-21) were adapted from those used by (Anderson & Narus, 1990).

Table 4-21: Scale items for supplier communication

Dimension	Code	Description
Production plans	SuppComm_Inform1	Keeping our [processor] informed on our production plans is very important to us (Anderson & Narus, 1984).
Problems	SuppComm_Inform2	We always let our [processor] know as soon as possible of any unexpected problems with things such as, delivery or [product] quality (Anderson & Narus, 1984).
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.5.3 Supplier profitability

There are a number of studies that refer to supplier performance and financial sustainability (Katsikeas, Paparoidamis, & Katsikea, 2004; Maloni & Benton, 2000{Maestrini, 2017 #8933). Furthermore, the buyers interviewed identified supplier profitability as an important performance criterion. These buyers wanted profitable suppliers to ensure they have long-term sustainable partners who are able to reinvest in their business and improve their long-term performance. This provides buyers with a long term of security of supply at a sustainable cost. Despite the focus on profitability buyers did not want their suppliers to have above normal profitability as this would indicate that buyer is paying excessive prices for the supplier's product. Subjective measures of financial performance and profitability

were used due to the difficulty of collecting and comparing objective financial data. This approach was supported by Dess and Robinson (1984) who showed that there is a strong correlation between self-reported subjective measures and objective measures of financial performance. The scale items for supplier profitability (Table 4-22) were adapted from items used by (Micheels & Gow, 2011). These involved three dimensions namely profitability, overall performance and financial performance.

Table 4-22: Scale items for supplier profitability

Dimension	Code	Description
Profitability	FarmPerf1_Profit	The profitability of our [product] operation was not satisfactory last year (Anderson & Narus, 1990).
	FarmPerf2_CompProfit	Compared other [product] farmers how would you evaluate: The profitability of your [product] operation over the last 3 years?
Overall performance	FarmPef3_SatProdn	We were very satisfied with the overall performance of our [product] operation last year (Micheels & Gow, 2011).
Financial performance	FarmPef4_SatFin	We were very satisfied with the overall financial performance of our [product] operation last year (Micheels & Gow, 2011).
These items were measured using five point Likert scales that ranged from: Strongly *agree* to *strongly disagree* and much higher to much lower		

4.5.4 Supplier loyalty

Supplier loyalty was included as a supplier performance item. This is because loyalty is defined as a behavioural outcome. In this perspective loyalty measures the supplier's ongoing supply to the buyer. This makes supplier loyalty different from commitment. Loyalty goes beyond calculative commitment and means that a supplier will continue to support a buyer even when it may no longer be economically rational to do so (Table 4-23). Loyalty is defined as a state of attachment that is experienced as an allegiance or faithfulness (Gilliland & Bello, 2002). If a supplier has a strong sense of loyalty towards a buyer then the supplier may sacrifice short-term benefits to achieve long-term objectives. (Gilliland & Bello, 2002). A loyal supplier will try to resolve conflict in the relationship rather than exiting. A fundamental component of loyalty is the forsaking of alternatives and becoming less sensitive to price, at least in the short term. The scale items for loyalty (Table 4-23) were adapted from Liu, Li, and Zhang (2010) and Bensemann et al. (2011).

Table 4-23: Scale items for supplier loyalty

Code	Description
CommitL1_OptRev	Reverse score of: It is important to have more than one option to sell our stock (Bensemann et al., 2011).
CommitL2_PriceComp	How would you react if one of [processor] competitors consistently offered a higher price for animals of equal quality/specifications?
CommitL3_PriceRev	Reverse score of: If the price was good it doesn't matter who we supply our stock (Bensemann et al., 2011).
CommitL4_SpotMktR	Reverse score of: You will always get better prices over the season if you play the market (Bensemann et al., 2011).
CommitL_5_SuplOne	It is important to us to be committed to one company to supply our stock (Bensemann et al., 2011).
These items were measured using 6 point Likert scales that ranged from: Strongly *agree* to *strongly disagree* and *switch to a competitor as soon as technically feasible* to *a competitor's price would have no influence on our current commitment to our [processor].*	

Many of these items relate to the choice to continue to supply despite a difference price and the importance of loyalty to a single buyer as well as a choice to be committed to a buyer rather than participating in the spot market.

4.5.5 Delivery quality and quantity

Delivery to specific quality specifications and reliable delivery are important aspects of supplier performance. Meeting quality specifications reduces sorting costs and ensures the buyer can meet their customers' requirements. Having suppliers with the ability to achieve quality standards is, therefore, a key factor in achieving a competitive advantage and, therefore, superior performance for the buyer. Quality is highly context-specific, therefore, the dimensions of quality were specifically developed to define quality from a stock delivery perspective. Reliable delivery of the required numbers of stock is important to meet customers' requirements for consistent supply and efficiency of plant operations. The scale items were, therefore, developed to incorporate delivery reliability in terms of numbers of animals and quality required (Table 4-24).

Table 4-24: Scale items for delivery quality

Dimension	Code	Description
Quantity	QualDel_Numbers	We always deliver the number of animals we agree to supply to our [processor].
Quality	QualDel_Quality	We always deliver the quality of animals our [processor] requires.
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

4.6 Controls

To ensure the robustness of results, the study included a number of control variables. The control variables include farm characteristics which relate to the tangible assets owned by the supplier. These can have a significant effect on performance. They were treated as controls, because the study looked specifically at relationship and human resources and their effect on supplier performance. Other control variables included governance mechanisms, including contract supply and supplier vertical integration through owning shares in the processor. The farm characteristics include farm financial resources, climate, farm type, farm size, location, management role, farmer age and education. External environmental uncertainty was also treated as a control. These are variables that are not part of the theoretical model that need controlling as they have an impact on the model.

4.6.1 External: Environmental uncertainty

The external environment refers to contexts and situations that occur outside the firm. This includes significant factors outside the organisation that can affect its performance including market conditions, and economic and political issues. Environmental uncertainty refers to the rate of change and the degree of instability in the environment (Wang, Yeung, & Zhang, 2011; Yeung, Lee, Yeung, & Cheng, 2013). An important part of environmental uncertainty is the extent to which market demand changes rapidly (Geyskens et al., 1998). As well as this within an agricultural context the variability of production also effects the uncertainty of the external environment. Therefore, scale items were developed for both market uncertainty (Table 4-25) and production uncertainty (Table 4-26). The scale items for environment uncertainty were adapted from Wang et al. (2011), Ganesan (1994), Villena et al. (2011) and Nooteboom, De Jong, et al. (2000)

Table 4-25: Scale items for environmental uncertainty – market uncertainty

Dimension	Code	Description
Competition	UncertMkt1_Comp	The nature of competition in the international market for [product] is intense (Villena et al., 2011).
Consumer needs	UncertMkt2_Cust	There are rapid changes in consumer needs and preferences for [product] is (Wang et al., 2011).
Price	UncertMkt3_Price	The market price for New Zealand [product] on the international market is highly volatile (Villena et al., 2011).
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.		

Table 4-26: Scale items for environmental uncertainty - production uncertainty

How Much certainty is there in:	
UncertProd1_8mthR	Reverse of The numbers and weight of the animals you can supply to [processor] 8 months ahead? (De Jong & Nooteboom, 2000).
UncertProd2_Cost3yR	Reverse of Your production costs over 3 years (De Jong & Nooteboom, 2000).
These items were measured using a 6 point Likert scale ranging from: *extremely uncertain* to *fairly certain.*	

4.6.2 Farm financial risk

Farm debt is an important control variable as it affects the supplier's ability to take risks and relates to the financial resources of the supplier. This was controlled for as a lack of financial resources may limit a supplier's ability to meet supplier performance criteria. Three items were used debt servicing as percentage of total farm income, the proportion of non-farm income relative to total gross income, and total farm debt as a percentage of total farm assets (Table 4-27).

Table 4-27: Farm debt and off-farm income items

Code	Description
RiskDbtAsset	Total farm debt as percentage of total farm assets (%).
RiskDbtServ	Debt servicing as a percentage of total farm income (%).
RiskOffFarmInc	Proportion of non-farm income as percentage of your total gross income (farm and non-farm) (%).

4.6.3 Climate

Climate has a significant effect on the ease with which suppliers can meet high product specifications and maintain consistent delivery schedules. Suppliers that have dry summer climate or cold winters and spring will find it more difficult to deliver consistent quality and numbers of stock (Table 4-28). Climate is also part of the farm physical (tangible) resources and, as these are not included in the theoretical model, they were included in the control variables. Three measures for climate were developed that focus on measuring the favourability of these three seasons. For spring and winter, temperature was most important whereas, in summer, the degree of dryness was most significant.

Table 4-28: Climate index

Code	Description
Clim_SPRG	Spring temperature of your [product] is unit.
Clim_SUM	Summer climate of your [product] is unit.
Clim_WINT	Winter temperature of [product] is unit.
These items were measured using a 6 point Likert scales that ranged from: Spring – *Extremely col*d to *warm*, Summer – *Extremely summer dry* to *summer moist* and winter – *Extremely cold* to *warm.*	

4.6.4 Supplier decision making influence

The level of the supplier's influence on strategic and operational decision is likely to affect the perception of the relationship with the processor. A supplier with low levels of decision

making influence may have little choice of the processor and/or the level of supplier performance (Table 4-29). For this reason it was included as a control variable to ensure this factor was accounted for in the results.

Table 4-29: Scale items for decision making influence

Code	Description
Infl1_Strat	How much influence do you have in the decision making on the farm? - for long term, strategic decisions.
Infl2_Tact	How much influence do you have in the decision making on the farm? - for day to day (tactical) management decisions.
These items were measured using a 7 point scale the ranged from: *All* to *none.*	

4.6.5 Descriptive farm and farmer characteristics

A number of other variables were included in the survey (see section 5.4.1) to support the analysis of the data. These were included to provide descriptive information about the farm and the supplier. These included such things as ownership structure, region, type of farm, supplier, age, education and experience, farm size, and years supplying the processor (Table 4-30).

Table 4-30: Farmer and farm business characteristics

Code	Description
Ownership	Which best describes the ownership arrangement of your farm?
Region	What region is your farm located?
Role	What role best describes you?
SuppYrs_Product	How many years have you supplied your current [product] to your [processor]?
Type Farm	What type of operation is your farm?
Yrs_Age	Age in years?
Yrs_CFarm	Experience? Total years on your current farm?
Yrs_Farm	Total years farming? Years.
LabourUnits	Full time labour units are working on your farm (including yourself)?
LocationIsland	Farm location (North Island/South Island).
LStockBuyer	Livestock buyer an employee of your [processor] or are they an independent livestock buyer?
FarmSize_TotUnit	Total farm size per unit.
FarmSize_Prod	Farm Size [product] Effective Area (Hectares).
FarmSize_Total	Farm Effective Area (Hectares).
EduMax	What/ was the highest level of education you attained?

4.6.6 Governance mechanism: Contracts and shareholding

Contracts and shareholding are an important governance mechanisms that can affect the relationship between the supplier and buyer. It was necessary, therefore, to control for the impact of these on supplier relationship quality and performance. The items covered whether they supplied product on contract as well as the percentage that was supplied on contract. Ownership of shares by the supplier and length of time owning shares were also taken into account (Table 4-31).

Table 4-31: Contracted supply measurements

Code	Description
Contract_Y_N	In the last year have you supplied [product] on contract (with quality/and/or delivery specifications) to your [processor].
ContractPct	What % of your [product] sales were supplied on contract?
Shares_Yes_No	Is your farm business a shareholder in your current [product] [processor]?
SharesYrs	How many years has your farm business been a shareholder of your/[processor]?

4.6.7 Communication from processor

Communication from the processor is likely to affect the quality of the supplier relationship with the processor. As the study only looked at supplier factors this was included as a control variable. The frequency of both face-to-face communication and communication by phone, email or text were measured (Table 4-32).

Table 4-32: Processor communication measurements

Code	Description
CommFace	How often would you have face to face contact with someone from [processor]?
CommPhone	How often would you have contact with someone from [processor] (by phone, email or text)?

Chapter 5: Research design and methods

5.1 Introduction

This chapter describes the research design and methods used to develop and test the theoretical model and its associated hypotheses. The research involved both qualitative and quantitative research methods. The qualitative research enabled a more in-depth study of the supplier and relationship characteristics, relationship quality and supplier performance. This also enabled the incorporation of the buyer's perspective on supplier performance which was not included in the quantitative research. The quantitative research was able to measure the relationships and test the hypotheses between the constructs by providing tests for statistical significance and model fit.

The chapter also explains the sampling method, questionnaire development, methods used for the data collection and preparation, as well as tests for normality. The first part discusses the qualitative research phase and how this relates to the rest of the research. The second part explains the development of the survey instrument and the method used to ensure validity of the measures used in the questionnaire. The final section looks at the data collection, including the sample size and methods used in the data preparation.

5.2 Qualitative research

As previously mentioned, there is a lack of established theory and empirical results for the interactions between supplier characteristics, relationship attributes, relationship quality and supplier performance, especially in the agri-food context. Therefore, the initial phase of the research employed an explorative case study approach informed by the literature review. This method was used in order to gain insight into the complex factors that contribute to the formation of high-quality supply relationships. A multiple case studies method was used as this has advantages in identifying patterns as well as enabling the triangulation of the results (Yin, 2003).

The purpose of the case study research phase was to support the development of a theoretical framework in conjunction with the literature. The literature review identified the main theories and constructs related to relationship quality and supplier performance in supply chains. The exploratory case studies attempted to verify the theoretical constructs from the literature and identify any additional constructs. From this, the theoretical framework was further refined. The case studies, like experiments, are generalisable to a

theoretical proposition, but not to populations. The goal of this phase of the research is to expand and generalise theories or analytical generalisations, not to attempt to make statistical generalisations (Yin, 2003).

5.2.1 Qualitative data collection

The first stage of data collection involved in-depth semi-structured interviews with 25 farmer suppliers. The interviews took between sixty and ninety minutes. The interview questions included topics that were based on the plan of the enquiry. The aim was to establish rapport and develop a conversation in which the interviewer provided the general direction of the discussion with the ability to pursue specific topics raised by the respondent (Babbie, 2012). Indirect questioning was used, as appropriate, to avoid social desirability bias (Fisher, 1993).These face-to-face, on-site interviews were complemented by secondary data, such as published company information, supply agreements and newspaper reports. Other secondary data included observations at supplier field days and informal personal communication with suppliers and company personnel. Secondary data provided additional information and validation of the interview data.

The 25 supplier interviews were recorded, transcribed and then coded using Nvivo research software, which enabled the organisation and analysis of unstructured qualitative data. The interviewees were selected from the company's supplier database and were chosen to provide a diversity of farmer and farm types. A unique feature of case study research is the ability for there to be an overlap between data collection and analysis. Constructs and their relationships can be adjusted as the research progresses. As themes emerged from the research new cases as well as additional data sources and interview questions were added (Barratt, Choi, & Li, 2011).

The study also adopted the perspective of Hatch (2002) whereby the qualitative data analysis is a systematic search for meaning. The data from the interviews included written notes and sound recordings. This was analysed using thematic content analysis (TCA) to look for patterns across cases to identify themes, relationships, develop explanations and build a logical chain of evidence (Babbie, 2012; Leech & Onwuegbuzie, 2007; Miles & Huberman, 1994). The case analysis enabled the description of emerging constructs and their relationships through detailed descriptive write-ups of each case. Secondly, cross case analysis was able to compare and contrast the patterns emerging from the detailed case write-ups (Yin, 2003). Furthermore, the write-up of the interviews and case studies were

sent to the processors and the suppliers interviewed. This enabled further validation of the results as well as ensuring that the theoretical constructs were related to the company and supplier experience.

The semi-structured interviews were undertaken with suppliers from three New Zealand agri-food exporting companies between May 2012 and October 2014. A purposeful sampling method was used to ensure the companies interviewed covered a range products, and markets (Patton, 2005). The companies selected all had a focused-differentiation strategy[18] (Porter, 1985) and the products exported included, beef, lamb and venison; their key markets were in the European Union, North America, Asia and the Middle East. The companies were accessed by approaching key personnel within these companies and explaining the purpose of the research. The suppliers were selected by the companies to provide a range of suppliers with different characteristics, relationship quality and performance. The suppliers were also required to meet high product specifications in terms of timing of delivery, food safety. The number of interviewees was determined by assessing when little new information was being added by each additional case.

5.2.2 Validity – qualitative research

Although the study was exploratory in nature, it was still important to ensure validity. Establishing validity for qualitative research is a complex, ill-defined procedure with a range of different perspectives (Creswell & Miller, 2000). To address this the methodology of Cho and Trent (2006) was adopted. In their view validity considerations need to be present throughout the research process. They highlight the need for an ongoing consideration of the researcher's concerns, safeguards and contradictions. This perspective of validity is known as transformational validity and adopts the view that the data can neither be valid or invalid however what is most important is the validity of the inferences drawn from the data (Hammersley & Atkinson, 2007). In contrast, transactional validity involves abstract strategies that apply procedures such as bracketing, triangulation and member checking. The weakness of these abstract techniques is when it is believed that by employing these techniques validity is assured (Maxwell, 1992).

Transformational validity involved both interpretive validity and theoretical validity. Interpretive validity involves identifying "what objects, events and behaviours mean to the people actually engaged in and with them" (Maxwell, 1992, p. 288). This seeks to

[18] This was judged by whether they were selling branded products.

comprehend the data through the participants' perspective and categories. Accordingly the study focused on interpreting the data in the language of the interviewees and as much as possible using their own words and concepts (Maxwell, 1992). Another important aspect of transformational validity is the necessity for the researcher to make explicit their own lens which includes the assumptions, beliefs and biases. In this research, the researcher was aware of his interest in developing and promoting high value agri-food supply chains and involvement in researching and teaching on this topic.

The research also applied the principles of transactional validity. Member checking was carried out during the interviews. This involved reflected back the interviewees' comments to gain agreement regarding the accuracy and meaning of their statements. Triangulation of sources as described by Patton (1999) was used which involved checking for the consistency of different data sources. In particular the perspectives and experiences of different cases and interviewees were evaluated for consistency among responses (Creswell & Miller, 2000).

External validity was achieved through proximity and similarity (in the selection of companies that had similar strategies but different products and markets (Campbell, 1986). Internal validity was assured through the number of supplier informants selected within each group and selection of suppliers that had a broad range of perspectives.

5.3 Results of qualitative research

The results of these interviews identified that the main factors that attracted suppliers to these supply chains were increased price certainty, premium prices and relationship quality. Many suppliers wanted to break away from the agricultural commodity cycle, which they saw as disconnected from customer demands and characterised by price volatility. They saw themselves as better than average producers with the ability to produce high-quality products. They valued the relationship with the companies they supplied as this gave them access to premium markets where they felt they would be rewarded for their efforts. There was a high level of trust in these relationships which was built on openness and transparency in communications as well as confidence in the character of the company personnel. The success of differentiated agri-food supply chains requires capable and committed suppliers (Micheels & Gow, 2010). Companies that are developing a differentiated strategy need to identify suppliers who have the ability to produce high-quality products and want to be involved in a customer-focused supply chain. For suppliers, this enables them access to premium markets. The interviews with the companies defined the supplier performance

constructs used in the qualitative research. These were reliable delivery of required quality and quantity of stock, communication, loyalty and profitability. These interviews confirmed that constructs such as relationship quality, supplier ability and motivation, customer focus and supplier net benefit, were important factors in the theoretical model. The qualitative phase of the research supported the development of the survey instrument, especially where there were no established measurement items in the literature. More detail on the results of the quantitative research have been published by Lees and Nuthall (2014).

5.4 Quantitative research

The quantitative research involved the development of a survey instrument that could measure the scale items to enable calculation of the latent constructs though factor analysis. The constructs developed from the factor analysis were tested by confirmatory factor analysis and provided the inputs into the structural equation modelling (SEM) analysis. SEM was chosen for this research due to its ability to analyse a large number interrelated relationships in a single analysis. It also enables the analysis of relationships between latent constructs. SEM involves a combination of factor analysis and multiple regression analysis.

5.4.1 Development of the survey instrument

Based on Churchill (1979), the development of the survey instrument followed a four step process. An extensive literature review was conducted to obtain the initial pool of scale items. Following this, as described above, interviews were carried out with farmers supplying beef, venison and sheep meat to processing marketing companies. Interviews were also held with selected processing company personnel. These interviews helped in choosing a specific number of scale items to be used in developing a pre-test survey. The pre-test survey was sent to processing/marketing company personnel and also administered in person to 10 farmer suppliers. This enabled the survey to be tested for structure, readability, ambiguity and overall completeness. A copy of the final survey can be found in Appendix G.

5.4.2 Construct validity

Ensuring construct validity is important for establishing the quality of the research. Construct validity confirms that the measures used reflect the concept being measured. Without this, it is impossible to know to what degree the scale measures actually relate to the theoretical constructs (Calder, Phillips, & Tybout, 1982). By establishing construct validity, legitimate inferences can be made from the measures to the theoretical constructs (Hair, Black, Babin, & Anderson, 2010). Construct validity is described by Netemeyer, Bearden, and Sharma

(2003) as the “overarching quality of a research study, with other categories of validity subsumed under construct validity” (p71). It involves establishing that the constructs measure the direction and size of the effect of the constructs and are not affected by factors from the domain of other constructs or the error variance (Netemeyer et al., 2003). Construct validity cannot be directly assessed but is inferred from the quality of the procedures in the development and validation of the scale measures. Content, face and criterion validity are three essential criteria for establishing construct validity (Netemeyer et al., 2003).

5.4.3 Content and face validity

The process recommended by Churchill (1979) was followed to ensure content and face validity. Content and face validity refer to how well the constructs are translated into the scale items used in the survey instrument (Netemeyer et al., 2003). The literature review was used to define the domains of the constructs and to obtain an initial pool of scale items used in previous research. This process ensured that the domains were clearly defined and, where possible, had been validated in previous research. It also ensured that the scale items adequately represented the dimensions of each of the constructs. Convergent and discriminate validity were assessed in the measurement model during confirmatory factor analysis, see Table 6-13 Table 6-16.

5.4.4 Criterion validity

Establishing criterion validity involved using measures external to the measurement instrument to support the validity of the instrument. The survey was first administered to supplier groups that were delivering to higher product specifications and under contract supply arrangements. These specific groups require greater trust and commitment than is normal for meat industry suppliers, enabling an evaluation of predictive validity (Figure 5-1). The survey also measured factors, such as length of supply, type of supply arrangement and ownership of shares, which also provided some external validity by correlating with the theoretical constructs.

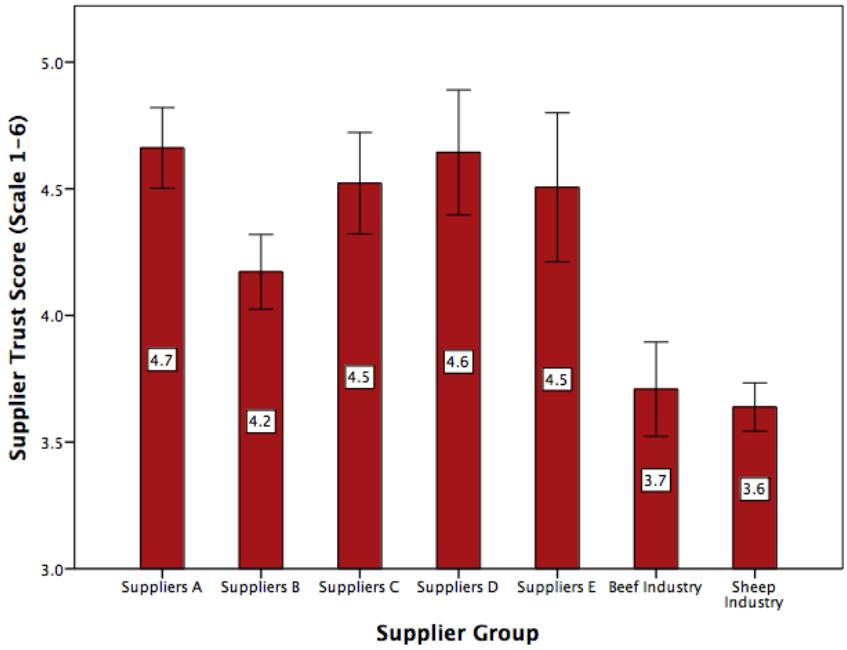

Figure 5-1: Comparison of level of trust for different supplier groups and sheep and beef industry average[19]

Figure 5-1 is an example of the measuring trust for five different supplier groups and comparing them to the New Zealand sheep and beef industry average[20]. These companies represent those selected for the qualitative research[21]. The graphs for commitment and satisfaction are shown in Appendix A (Figure A. 5 & Figure A. 6.) These results indicated that the measures have sufficient criterion validity as they correctly identified the differences between the supplier groups and the average for the sheep and beef industry.

[19] Results from the main survey.
[20] Data from the main survey. The methodology for development the trust scale is explained in section 4.4.1.
[21] Some companies had more than one supplier group.

Table 5-1 also provides further evidence of criterion validity. Ownership of shares, supplying stock on contract and the percentage of stock sold under contract were all predictors of higher levels of commitment. This is the case with each of these factors having significantly higher levels of commitment. Ownership of shares has a small but significant ($p<.05$) difference on commitment. Suppliers who own shares had a higher level of commitment than those who do not. There was a larger and more significant difference ($P<0.001$) and ($p< 0.01$) between supplier who have contracted supply.

Table 5-1: Relationship between commitment and share ownership and contracted supply from supplier survey. Independent sample t-test.

	Ownership of shares	**Mean of commitment scores**	**P-value**
Commitment	Yes	3.6	0.037**
	No	3.5	
	Supply on contract	**Mean of commitment scores**	**P-value**
Commitment	Yes	3.7	0.000***
	No	3.4	
	% supply on contract	**Mean of commitment scores**	**P-value**
Commitment	0 – 50%	3.6	0.004***
	50 – 100%	3.8	
The mean score represents the mean of the commitment scores. These ranged from 1 = low commitment to 6 = high commitment. Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *			

5.5 Operationalisation of constructs

Where possible, the study used existing measures validated in previously published studies as this enhances the content validity of the measures. Where there were no adequate established measures of constructs new measures were developed (Hair et al., 2010).

5.5.1 Sample size

The choice of the appropriate sample size for the research was an important but a complex consideration both for the proposed factor analysis (FA) and the structural equation modelling (SEM) techniques. While there are good guidelines for sample sizes in factor analysis, this is not the case for SEM. Factor analysis requires 5-10 subjects per measurement item (Hair et al., 2010; Nunnally, Bernstein, & Berge, 1967). In contrast, the literature gives no clear answer to how large a sample size should be for SEM. There are, however, some considerations and rules of thumb that can be used. SEM modelling requires larger sample sizes than other multivariate techniques (Hair et al., 2010). DeVellis (2012), Leisa Reinecke and Pearcy (2001) and Spector (1992) suggest SEM samples sizes ranging

from 100 – 300 while Kline (2005) recommends an ideal sample size to parameter ratio in the range of 10:1 to 20:1.

Hair et al. (2010) identified five considerations that affect the required sample size for SEM. These are the multivariate normality of the data, the estimation technique, model complexity, the numbers of missing data and the average error variance among the reflective indicators. To avoid the problem of deviation from normality he recommends 15 respondents for each parameter estimate in the model. The common SEM estimation technique, maximum likelihood estimation (MLE), will provide a valid result with a minimum sample size of 50 under ideal conditions. However, with factors such as measurement error and missing, data sample sizes in the range of 100-400 are recommended (Hair et al., 2010). More complex models require larger samples because of a larger number of indicator variables and constructs. Larger sample sizes are also necessary where there are constructs with fewer than three indicator variables or where multi-group analysis is required (Hair et al., 2010). Larger sample sizes are also recommended if communalities (variation among indicator variables) are lower than recommended. If factor loadings were less than 0.7 and the communalities less than 0.5 then larger sample sizes were required (Enders & Bandalos, 2001; Hair et al., 2010).

Based on the summary recommendations of Hair et al. (2010), a minimum sample size of 500 was chosen due to the large number of constructs, some with lower communalities, and there being some constructs with fewer than three measured items. This study has 88 variables to be factor analysed; this required a sample size of 440 - 880 for the factor analysis and 880 - 1760 for the structural equation model. The final sample size was 838 usable responses from the survey, which was considered adequate for the factor analysis and within the range of 880 - 1760 for the structural equations model.

5.5.2 Data collection

The sampling frame for the survey was the New Zealand AsureQuality registered farmers' database. A stratified sample of 5944 farmers was provided by AsureQuality. This provided postal addresses for farmers in the research sample. There were only a small number of farmers in the sample who had email addresses and many of these were inaccurate, so a postal survey was considered the most suitable. As well as this, Pennings, Irwin, and Good (2002) identified a number of advantages of a postal survey compared with other types of data collection such as telephone and face to face interviews. Furthermore, research has shown that email or online surveys achieve a lower response rate than paper surveys (Shih &

Fan, 2008). Farms in the sample had to be over 30 ha to ensure they were commercial operators. The sample was stratified according to location, size and farm type using Statistics New Zealand data to ensure representativeness.

The research used a stratified probability sampling method. Stratification was used to improve the degree of representativeness by decreasing the probability of sampling error. The mail survey was sent to farmers between October 2013 and March 2014. A letter was sent with the survey explaining the purpose of the research, together with a free-post return envelope. A follow up survey was sent out to farmers who had not returned the survey to increase the sample size and enable testing of non-response bias.

5.6 Data preparation

This section describes the data preparation and the tests used to evaluate the quality of the data. Also, the data is analysed in terms of key descriptive criteria. The first section describes the methods used to prepare the data and explains how issues such as outliers and missing data were addressed. It also describes the tests undertaken to ensure the data met the criteria for normality. Following this, the next section evaluates the response rate for the survey and checks for non-response bias. The data is also assessed for representativeness. Finally, a descriptive analysis describes some of the key characteristics of the survey respondents.

5.6.1 Outlier detection

Analysis to identify outliers was based on standard deviations from mean values. Babbie (1992) recommends that for a large sample size only values greater than four standard deviations should be considered outliers. Based on this criterion there were no outliers in this sample. Unengaged responses were identified by calculating the standard deviation of for the responses of each case (Babbie, 1992). Where there were very low standard deviations in responses these cases were deleted. None of the responses met the criteria for deletion.

5.6.2 Missing data

Cases with more than 50% missing data were also excluded. This resulted in the rejection of 36 cases. The remainder of the missing data was dealt with by pairwise deletion. This method attempts to use all available data and discards data on a variable by variable basis.

5.6.3 Normality test

Normality is an important criterion for SEM; this was tested for using a Kurtosis test (Hair et al., 2010). The data presented below are for variables that had kurtosis values >2 or < -2. A rule of thumb suggested by Kline (2005) was that a KI > 10 or KI < -10 suggested a problem with the assumption of normality. Some of the social capital variables: C.SocCap1C_Goal, C.SocCap2_Values, R.SocCap5_Personal, R.SocCap6_Recip, R.SocCap7_Trust had slightly higher kurtosis values (Table 5-2). This indicated that the data in these variables were more tightly clustered around the mean than in a normal distribution. The values were all below the value of 10 suggested by Kline (2005); therefore, overall, the assumption of sufficient normality for SEM was accepted.

Table 5-2 Kurtosis analysis: Variables with normality concerns

Variables	N		Kurtosis
	Valid	Missing	
Shares Yrs	451	495	**2.1**
C.SocCap1_Goal	933	13	**7.8**
C.SocCap2_Values	932	14	**7.5**
R.SocCap3_Bond	930	16	**4.1**
R.SocCap4_Friend	928	18	**4.3**
R.SocCap5_Personal	928	18	**5.0**
R.SocCap6_Recip	929	17	**5.1**
R.SocCap7_Trust	930	16	**5.6**

These tests for validity, evaluation of research methods and data collection provide good evidence that the data is suitable to progress with factor analysis and the structural equation modelling.

5.6.4 Response rate

The survey had an overall response rate of 20 percent (Table 5-3) with 14% usable replies. The surveys were mailed out twice to maximise the response rate and to enable an estimation of non-response bias (see section 5.6.6). 5944 surveys were sent out in the first mail out and 4720 in the second mail out. A total of 688 surveys were returned in the first mail out, representing a 12% total response rate. The second mail out was done six weeks later, and a further 537 surveys were returned (11% total response rate). This brought the combined total response rate up to 20% Table 5-3. The data was also tested for non-response bias to provide further evaluation of the representativeness of the data (see section 5.6.6).

This response rate was lower than some previous surveys of farmers in New Zealand. For example, Stafford, Mellor, and McMeekan (2000) and Old and Nuthall (2014) surveying New Zealand dairy farmers achieved a usable response rate of 27% and 36% respectively. In another study surveying sheep and beef farmers, Bensemann et al. (2011) achieved a 28% usable response rate. The low response rate may have been affected by the length of the survey and the time of year the survey was sent out (Pennings et al., 2002).

Table 5-3: Survey response rate

	First time		Second time			Total mailed out	Total Response Rate
Farm Type	**Complete**	**Incomplete**	**Complete**	**Incomplete**	**Total**		
Deer	112	31	50	49	242	833	29%
Beef	75	31	73	54	233	1707	14%
Sheep & Beef	344	75	184	127	730	3404	21%
Total	531	137	307	230	1205	5944	20%

Despite the lower response rate, it was considered sufficient for the purpose of the principle component analysis and structural equation modelling. This was because the data was not being used to estimate parameters for the total population (Hair et al., 2010). Furthermore, Cook, Heath, and Thompson (2000) argue that the representativeness of the replies is more important than response rate see Table 5-4, Table 5-5, Table 5-7, Figure 5-2 and Figure 5-3 for representativeness. Furthermore, Morton, Bandara, Robinson, and Carr (2012) explain that a low response rate does not mean low validity but only that there is a greater risk of this and that response rates on their own are not good proxies for study validity.

The survey response rates are shown in Table 5-3. The response rate was highest for the deer farmers followed by the sheep and then the beef producers. The lowest response rate was for the beef farmers. This is likely to be because many farms are mixed sheep and beef with relatively few specialist beef operators. The database did not always classify these farmers accurately as some farmers may classify themselves differently to the Agribase data. Furthermore, some specialist beef farmers produce replacement heifers for the dairy industry and, as they do not supply a processor they may not have completed the survey. This indicated that the actual response rate for beef farmers might have been higher than recorded. This would also increase the overall response rate for the survey.

5.6.5 Representativeness

Representativeness of the sample was tested by comparing the survey responses against the Agribase stratified farmer data. These were compared with farm size and regional distribution. These two variables were the only individual data other than postal addresses provided in the Agribase data.

Table 5-4: Chi Square test for differences between the AgriBase database and the survey responses.

Region	AgriBase data base	Survey responses
Auckland	8.5%a	1.8%b
Bay of Plenty	3.4%a	3.2%a
Canterbury	18.8%a	16.2%a
Gisborne	3.9%a	3.9%a
Hawke's Bay	7.4%a	10.4%b
Nelson-Marlborough	4.8%a	5.4%a
Northland	5.6%a	4.3%a
Otago	8.6%a	13.6%b
Southland	10.8%a	13.8%b
Taranaki	3.2%a	1.4%b
Waikato	9.5%a	10.1%a
Wanganui-Manawatu	10.4%a	12.2%a
Wellington	3.8%a	3.4%a
West Coast	1.3%a	0.3%b
Each subscript letter denotes a subset of Agribase and survey categories whose column proportions do not differ significantly from each other at the .05 level. Regions with a different subscript letter are significantly different at the O.05 level.		

Table 5-4 compares the regional distribution of the stratified sample from the Agribase data and the actual regional distribution of the survey responses. Five of the regions have a statistical difference between the AgriBase data and the survey responses. Of these regions Hawkes Bay, Otago and Southland are over-represented compared to the Agribase data and Taranaki, Auckland and the West Coast are under-represented Table 5-4.

Table 5-5: Independent t-test: Comparing mean farm size.

Source of data	N	Mean farm size	P. (2-tailed)
AgriBase database	5900	490.41	0.554
Survey responses	824	521.00	0.524

Table 5-6: Chi Square comparison of farm size classification for the 2012 agricultural census, the survey data base and the survey responses

Farm Size class	Agricultural Census 2012	Agribase	Survey	Follow Up Survey
10 to 19ha			1.0%b	1.6%b
20 to 39ha			1.2%b	2.1%b
40 to 59ha	1%		3.1%b	5.8%b
60 to 79ha	4%	11.6%a	5.9%b	6.2%b
80 to 89ha	5%	5.1%a	4.2%a	2.9%a
100 to 199ha	17%	27.7%a	23.5%b	22.2%a,b
200 to 399ha	31%	28.1%a	30.8%a	28.8%a
400 to 599ha	13%	10.6%a	10.6%a	10.7%a
600 to 799ha	8%	4.9%a	5.7%a	4.1%a
800 to 999ha	4%	3.1%a	3.1%a	2.5%a
1000 to 1999ha	11%	5.6%a	7.0%a	5.8%a
2000 to 3999ha	4%	1.8%a	1.9%a	5.3%b
4000ha+	3%	1.4%a	1.9%a	2.1%a
For all variables with the same letter, the difference between the means is not statistically significant.				

An independent t-test comparing mean farm size (Table 5-5) between the Agribase database and the survey responses showed there is no significant difference between mean farm size at the 0.05 level (Table 5-5). A chi square test was also completed comparing the Agribase data for farm size and the survey responses (Table 5-6). This showed there were only two categories had a significant difference. These were 60 – 79 ha and 100 – 199 ha. The Agribase sample was stratified according to the Statistics New Zealand farm census data. This was to ensure that the survey mail out was representative to this sample frame. The over-representation of the smaller farms may be a result of these farms being more likely to be owner managers and, therefore, more engaged in the survey. There were also difficulties in accurately recording farm size because many farms have multiple blocks and multiple ownerships; this indicated the sample is a good representation of farm size. There may also inaccuracies in the stratification of the Agribase data supplied. Given these issues discussed above the representativeness of the survey was considered sufficient for the factor analysis and SEM. Further analysis was undertaken to compare the census data with farm size for each of the farm types included in the survey. This enabled the proportion of farm sizes for each farm type to be evaluated. There was an excellent representation of farm sizes for specialised sheep and sheep and beef farms (Table A: 6, Table A: 7 and Table A: 8). This was further assessed by farm type and regional distribution (Figure 5-2, Table A: 10 Table A: 11 and Table A: 12).

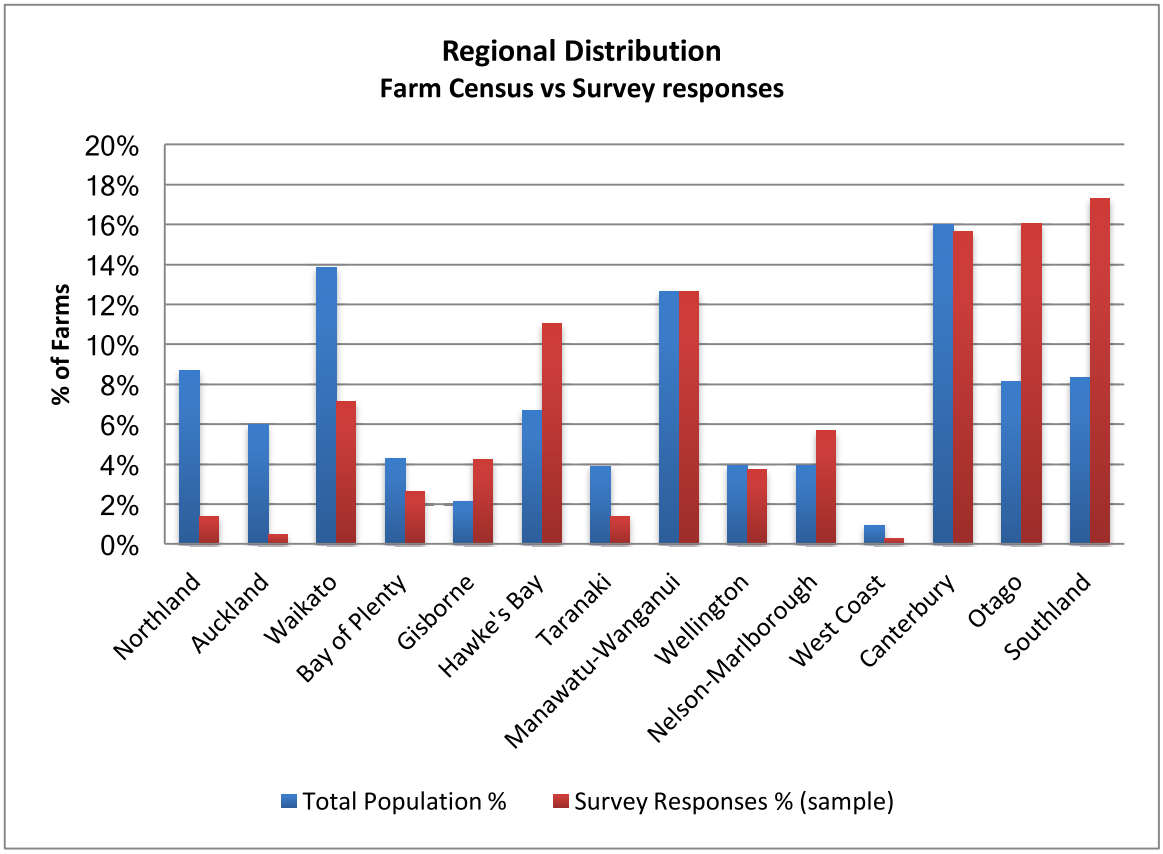

Figure 5-2: Comparison of survey data and regional distribution of responses from the survey

Another test of representativeness involved comparing the survey replies from suppliers to the different meat companies and their approximate market shares (Table A: 13 and Table A: 14). Given the importance of the supplier-processor relationships to the research, it was essential to ensure that all meat processors were fairly represented as the type of relationship between different processors may differ significantly. The market share of the meat companies was calculated by the European Union tariff free quota allocation and the USA beef quota allocation[22]. This enabled an approximate market share to be established for each of the processors. This data was compared to the survey sample of the sheep survey and beef surveys. This showed that all the processors were represented in the survey in similar proportions to the actual processing histories. In the sheep market share data, Silver Fern Farms and AFFCO were slightly over-represented, by 5% and 3%, respectively (Table A: 13). Table A: 14 shows the proportion of beef quota allocation compared to the survey responses. All the beef exporters were represented in the responses, most of them in a similar proportion to their market share. Silver Fern Farms had the largest difference, being under-represented by 8%, ANZCO was under-represented by 4 %, and AFFCO was over-

[22] The New Zealand Meat Board allocates the European Union tariff free quota and USA beef quota to companies based on their shares of processing volume for the preceding three production seasons (NZ Meat Board, 2013).

represented by 4%. The differences may be due to the survey respondents only identifying their primary processor as many farmers supplied more than one processor, this likely explained some of the differences. These tests for representativeness showed that there was a good distribution of responses across farm size, processor and region, indicating that the survey responses had acceptable representativeness.

5.6.6 Non-response bias

The survey was also assessed for non-response bias by comparing respondents from the first mail out of the surveys with respondents from the follow up mail out. This assumed that the responders who did not reply until they received a second survey required more encouragement to respond and were, therefore, more like non-responders (Armstrong & Overton, 1977). The non-response bias was assessed by a one-way ANOVA.

Table 5-7: One way ANOVA test comparing means of farm size

	N	Mean	Std. Deviation	F	P.
Agribase data	5900	490.41	1406.76	0.275	0.76
Survey	581	533.44	1396.12		
Follow-up	252	512.84	932.70		
Total	6733	494.96	1390.91		

The one-way ANOVA test confirmed that there was no statistical difference between the means farm size of the Agribase data, the sample and the second survey responses (Table 5-7). Further comparisons were evaluated between farm management role, farmer age (Figure 5-3) and stage of the business cycle. Paired sample t-tests were used to identify and significant differences. The results showed there were no significant differences in any of these variables, indicating that there was no statistical difference between the early and late responders to the survey.

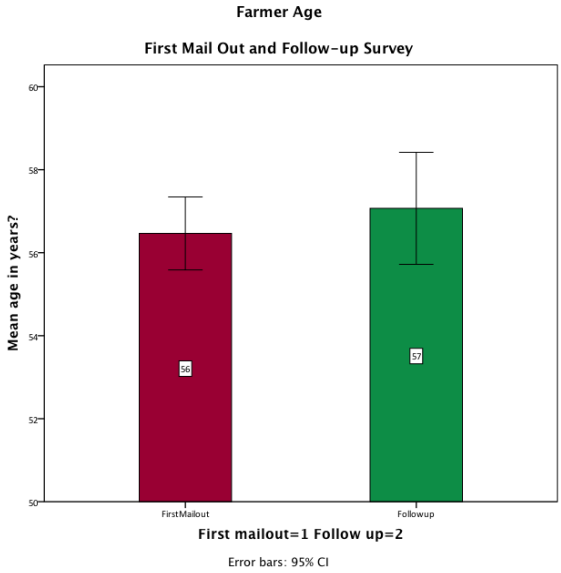

Figure 5-3: Comparison of mean age of farmers from first mail out and follow up.

The second method involved testing for differences in the mean scores of the variables measured in the survey. Significant differences in the values between the first survey and the follow up survey can signify non-response bias. A total of 245 variables were selected, and the initial and follow-up responses were compared using a paired sample t-test. Of these, 16 (7%) were found to have a significant difference (Table 5-8). This suggests that for 93 percent of the variables there was no significant difference between the two mail outs. There was, however, a significant difference for the some of the social capital variables (Table 5-8). These early responders were less likely to use the spot market (SpotMkt), were more likely to be willing to make long-term investments (Commit4_LTInvest), had greater farm management ability (SuppAbil2_Mgmt, SuppAbil2_Efficiency, SuppAbil4_Inn) and were less independent (SuppIndep2), as shown in Table 5-8. These results suggest a slight bias in the first mail out towards suppliers that have a strong connection and commitment to their processor. The low number of variables with significant differences indicated that although there was a difference in these variables this difference did not affect the values of the other variables.

Table 5-8: Variables with significant difference between initial survey and follow-up (2 tailed T-test)

Variable	First Mail Out: Mean score	Follow-up: Mean score	p-value	P
SpotMkt	2.9	3.2	0.006	**
R.SocCap7_Trust	4.3	4.0	0.003	***
R.SocCap6_Recip	4.3	3.9	0.001	***
R.SocCap_Personal	4.4	4.0	0.001	***
R.SocCap_Friend	4.2	3.9	0.018	**
C.SocCap_Bonds	4.1	3.7	0.002	**
C.SoCap_Values	4.5	4.1	0.001	***
C.SocCap1_Goals	4.6	4.2	0.001	***
ProcAbil2_SChain	4.5	4.3	0.008	**
CostFocus	3.9	4.1	0.019	**
SuppAbil2_Mgmt	3.8	3.6	0.038	**
SuppAbil2_Efficiency	3.5	3.2	0.008	**
SuppAbil4_Inn	3.5	3.2	0.006	**
Commit4_LTInvest	4.4	4.2	0.041	**
SuppPerf1_Farm	5.2	5.0	0.004	**
SuppIndep2	3.4	3.7	0.004	**
The scores represent the mean score for each variable. These ranged from 1 = low to 5 = high				

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Based on these analyses, it was concluded that non-response bias was not a significant problem with the data. Some caution may be necessary in using the social capital variables. The differences in these variables were less important as the data were primarily being used for to develop a theoretical model and not to generalise an established model to a new population or use descriptive statistics to generalise to a larger population.

5.7 Descriptive analysis

This section describes some of the characteristics of the respondents and their farm businesses. This was to establish that the sampling succeeded in providing sufficient variation in the respondents in terms of personal and farm characteristics. This also gives insight into the characteristics of the suppliers, which may enable a better interpretation of the results.

5.7.1 Supplier characteristics

Suppliers were classified based on education level, gender and age.

Table 5-9: Education levels

Highest Education level attained	%	Average Age (years)
Primary school	5%	61
Secondary school	46%	61
Post school certificate or other non-university diploma	5%	52
University Diploma	17%	54
University Bachelor degree	16%	51
Postgraduate university degree	3%	51

Table 5-10: Gender of respondents

Gender	% of respondents
Male	93%
Female	7%

Although 93% of the respondent were male (Table 5-10), those surveyed varied significantly in educational level and other characteristics. While 36% of respondents had a university diploma or degree, there were a significant number who had left school and gone farming without any further education (Table 5-9). This group, at 51%, was the majority of the respondents (Table 5-9). These farmers who had only primary or secondary education were more likely to be older farmers with an average age of 61 years. University-educated respondents were much younger than those with no post-secondary education by an average of 10 years, at 51 years. This indicated that there was a trend for younger farmers to be more educated and more likely to have a university qualification. It also showed that the sample succeeded in capturing significant variation in these characteristics.

5.7.2 Farm business characteristics

The farm business characteristics were categorised by farm size, labour units, location, farm class and ownership type as well as their management role (Table 5-11 to Table 5-21). In addition, the shareholding in their processor[23] and the length of time supplying their current processor was used to categorise the respondents.

[23] There are no publicly-listed processors, therefore, this demonstrates the level of membership of the cooperatives.

Table 5-11: ANOVA analysis comparing mean farm size and full-time labour units for lamb beef and venison

Farm type	N	Mean of full time labour units	Std. Deviation	P
Beef	143	2.4	5.8	0.609
Sheep	535	3.2	26.3	
Deer	155	1.3	0.9	
Total	833	2.7	21.2	
Farm Type	**N**	**Mean of farm size**	**Std. Deviation**	**P**
Beef	136	276.4	380.9	0.255
Sheep	498	991.9	7298.2	
Deer	155	284.7	958.2	
Total	789	729.6	5823.8	

The size of farms varied considerably with a mean area of 729 ha (Table 5-11). Despite this, the ANOVA analysis showed there was no significant difference in the mean of farm size between the beef, sheep and deer farms. The sheep farms had the largest mean farm size but also had the largest standard deviation. The mean of full-time labour units across all farms was 2.7. Sheep farms had the highest number of labour units at 3.2 and deer farms the least with a mean of 1.3. The ANOVA analysis (Table 5-11) confirmed that there was no significant difference between the means of the labour units implying that all farm types had similar staff numbers.

The respondents were split fairly evenly between the North and South Islands with a slight majority of 52% in the North Island (Table 5-12). The largest number of respondents were from Southland, Otago, Canterbury, Manawatu-Wanganui, and Hawkes Bay (Table A: 4).

Table 5-12: Location of respondents

Farm Location	%
North Island	52 %
South Island	48%

Table 5-13: North Island farm type

North Island Farm Class	%
Hard (elevated) Hill Country	8%
Hill Country	31%
Intensive Finishing	61%

Table 5-14: South Island farm type

South Island Farm Class	%
High Country	8%
Finishing Breeding	72%
Intensive Finishing	10%
Mixed Cropping/Livestock Finishing	10%

The farm class classifications were developed by the Meat and Wool Economic Service (MWES) to group farms into similar types. This showed that the North Island respondents had farm types that were predominantly intensive finishing farms (61%). In contrast, South Island farms were predominantly finishing breeding farms (Table 5-14) with only a small proportion of intensive finishing farms (10%).

Table 5-15: Type of farm ownership

Ownership Type	%
Corporate Farm	3%
Family farm	88%
Maori trust/corporation	1%
Other	8%

Table 5-16: Respondents' role in farm business

Role	%
Farm Owner and Manager	70%
Farm Owner[24]	23%
Farm Manager	5%
Other	3%

Table 5-15 and Table 5-16 show the types of farm ownership and the roles of the respondents in the farm business. The majority of the farms were family farms (88%) with predominantly the farmer being both the owner and the manager of the farm (70%). This is consistent with the results from a survey by Old and Nuthall (2014) . They found similar proportions of farms were run by traditional farmers. Family farms with owner managers tended to have a more significant relationship with the processor, as owners they can make both strategic and management decision themselves without reference to anyone else.

Table 5-17: Length of share ownership

Length of time	%
0 – 4 years	25%
5 - 10 years	35%
10 - 20 years	40%

Table 5-18: Length of time supplying current processor

Years supplying [processor]	%
0 – 4 years	19%
5 - 10 years	31%
10 - 20 years	20%
20+	30%

Table 5-18 describes aspects of the relationship with the processor. There was an even split between those who owned shares (48%) in their processor and those who did not (52%). As there are no listed or farmer-owned companies in the meat sector, this indicates that close to 50% of farmers supplied one of the two cooperative processors: The Alliance Group and

[24] Farm owner who has no involvement in day to day management of the farm.

Silver Fern Farms. Of these shareholders, the largest proportion (40%) had owned shares for more than ten years. There were, however, a significant number in the sample who had owned shares for fewer than five years (25%). The proportion of farmers had been suppliers to their processors for different lengths of time was relatively even (Table 5-18). A significant proportion of the respondents (19%) had been supplying their processor for fewer than five years. Although nearly a third of farmers had supplied their processor for more than twenty years, 50 per cent had supplied for fewer than ten years. This indicated that the data provided a good representation of the different characteristics of the processor relationship, including cooperative shareholding and length of the supply relationship.

Table 5-19: Proportion of debt and off farm income

Description	Mean %	S.D.
Total farm debt as percentage of total farm assets	16%	17.8%
Debt servicing as a percentage of total farm income	14%	15.9%
Proportion of non-farm income as percentage of total gross income	14%	22.8%

The sample had considerable variation in debt and off farm income profiles (Table 5-19). The mean debt to asset ratio was relatively low, at 16 %, and debt servicing was 14% of total farm income. Off farm income was low, at 14% of income with a large standard deviation. Significantly, more than a third of the sample (36.6%) had no off-farm income, and 30% had no debt. These results confirmed other research that has shown the sheep and beef farms have low levels of debt compared to other farm types, such as dairy farming.

Table 5-20: Stage of the business cycle

Stage	%
Entry	2%
Growth/Expansion	30%
Consolidation	42%
Exit	27%

The sample had considerable numbers in the growth/expansion, consolidation and exit stages of the business cycle. There was a low proportion in the entry stage. This low figure, combined with the significant number about to exit the industry, illustrated the difficulty in the meat industry of attracting younger farmers and new entrants to the industry. The older age of the sheep and beef farmers would also mean that many were looking to exit the industry or pass on the farm to the next generation.

Table 5-21: Supplied stock on contract in last year

Supplied stock on contract	%
Percentage of farmer who supply some stock on contract	38.5%
Percentage of total stock supplied under contract[25] (mean)	49%

The proportion of stock sold on contract gives a significant indicator of a closer relationship with the processor. It was important, therefore, to have sufficient variation in this factor. Nearly 40% of the sample had supplied at least some stock on contract in the last year and these farmers supplied almost 50% of their stock on contract (Table 5-21). This indicated that approximately 19% of all stock were supplied under contract to processors. Many farmers sold a proportion of their stock on contract but also sold some on the spot market to give themselves greater flexibility to manage climate risk.

5.8 Conclusion

This chapter outlined the research methodology, data collection and tests for validity for both the qualitative and quantitative research. The issue of most concern was the response rate compared to other surveys of New Zealand farmers. This was not considered a significant problem as SEM is not trying to estimate parameters for the whole population. Furthermore, the analysis confirmed sufficient representativeness of the data which is considered a more important test than the sample size. The results also showed sufficient evidence that non-response bias was not a problem. The descriptive analysis indicated that there was sufficient variation in the data to provide a good basis for the SEM. Therefore, the results show acceptable validity and representativeness was achieved, and there was sufficient variability to provide a good data set for the EFA and SEM analysis.

[25] Average percentage of stock supplied on contract by those suppliers who commit to a contract.

Chapter 6: Methodology and analysis: Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)

6.1 Introduction

This chapter contains the EFA and the CFA. The EFA tests the scale items developed in chapter 5 and the latent constructs they aim to measure. The EFA enables the identification of the common underlying variables. The analysis identifies the common variance in the scale measures, and this enables the loading of these variables onto common factors (Table 6-2). These factors are later tested using CFA. The CFA tests the factor structure developed in the EFA and enables an assessment of discriminant and convergent validly as well as reliability. This provides the latent factors for the SEM analysis in chapter 8.

6.2 Uni-dimensionality, construct reliability and internal consistency

The EFA tests for both construct reliability and internal consistency. These tests identify how interrelated each of the scale items are. A two-step process was used to test construct reliability. The first step used the exploratory factor analysis (EFA) to test for uni-dimensionality of the scales. This required all items to load onto a single factor, although Hair et al. (2010) note that it is common for individual items to have moderate loadings onto more than one factor. Next, Cronbach's Alpha was calculated as a measure of reliability. Cronbach's Alpha measures the internal consistency of the scale items. There are a variety of acceptable alpha values reported in the literature, ranging from 0.70 to 0.95 (Tavakol & Dennick, 2011). Values as low as 0.60 are considered acceptable in exploratory research (Hair et al., 2010). The number of items in a scale also significantly affect the Alpha value (Meyers, Gamst, & Guarino, 2006) with more scale items increasing the value of Cronbach's Alpha. Inter-item correlations were also evaluated to ensure that items with low correlation to other items in the factor were removed. Items were only retained if they were above the cut off of 0.30 (Flynn, Schroeder, & Sakakibara, 1994). Because of the large number of factors, the EFA was analysed with two separate sets of items and constructs. The first set focused on relationship measures (Table 6-2) with the second set comprising the supplier factors (Table 6-6).

6.3 Relationship and supplier factors

The scale items were divided into two groups due to the large number of measures. The groups were divided into supplier factors and relationship factors. These groups were

selected to ensure that constructs that may be correlated would be tested in the same analysis in order to determine if they were distinct constructs. The relationship factors included the measures of relationship attributes and relationship quality. The supplier factors included the supplier characteristics and supplier performance constructs. Alternative groupings were also tested to ensure that there was consistency in the results and provide additional evidence for the number of constructs (Cudeck, 2000). This analysis showed no difference in the factor structure and the measures of internal consistency. See - Appendix B (Table B: 3).

6.4 Exploratory factor analysis and confirmatory factor analysis

The EFA was used to identify the pattern of correlations between the scale items. This enabled the data to be reduced to latent factors based on the underlying structure of the data (Cudeck, 2000). In the EFA the scale items were allowed to freely load onto the latent constructs and cross load onto multiple constructs. These factors were further tested in the CFA (Figure 6-1 and Figure 6-2). This enabled confirmation of the validity of these factors that were then used in the SEM. The EFA analysis was carried out using IBM® SPSS® software using Principal Component Analysis (Kim, 2008) with a Varimax rotation (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The number of factors was determined by including only factors with Eigenvalues greater than one (Kaiser, 1960) as well as an evaluation of the scree plots (Cattell, 1966) - see Appendix B (Figure B 1 and Figure B 2). The EFA enabled testing for reliability, or internal consistency using Cronbach's Alpha. This measured the level of shared covariance between the scale items that make up the common factors. Cronbach's Alpha values above 0.60 were considered acceptable (Hair et al., 2010). In contrast to the EFA, the CFA required the scale measures to be fixed in terms of the latent factors they load onto.

In contrast to the EFA the CFA model, or measurement model, required the indicator variable to load onto the specified latent constructs; the model shows the covariance between the latent constructs. This enabled the factor structure to be tested for the goodness-of-fit between the measurement model and the data. The CFA also enabled calculation of additional validity measures. These included convergent validity and discriminant validity scores as well as an alternative reliability measure to Cronbach's Alpha which is the Composite Reliability (CR) score. Furthermore, the factor loadings on each construct were evaluated to identify items that have low correlations with the constructs. Items with factor loading below 0.50 were considered candidates for deletion to improve the validity of the construct (Hair et al., 2010). The CFA was analysed using IBM® SPSS® Amos

v22 software. Once the CFA met the acceptable values of goodness-of-fit , reliability and validity these constructs were then able to be used in the SEM (Table 6-11 and Table 6-14).

6.4.1 Analysis of relationship factors

The EFA for the relationship factors produced an 11-factor solution (Table 6-1). These factors all had an Eigen value greater than 1.0, and the 11 factors explained 72% of the variance. Factors with an Eigen value below one were excluded from the analysis. This level of variance explained was well above the 60% cut-off measure that is commonly used in the social sciences (Hair et al., 2010). All communalities were above 0.52 (Table B: 1). The scree plot for the factor analysis is shown in Figure B 1.

Table 6-1: Percentage of variance explained by relationship factors

	Rotation Sums of Squared Loadings		
Factor number	**Total**	**% of Variance**	**Cumulative %**
1	6.9	12.3	12.3
2	5.5	9.8	22.1
3	4.9	8.7	30.8
4	4.7	8.3	39.1
5	4.4	7.9	47.1
6	2.9	5.2	52.2
7	2.6	4.6	56.8
8	2.5	4.4	61.2
9	2.4	4.2	65.4
10	2.1	3.8	69.2
11	1.7	3.0	72.1

Most of the factor loadings (Table 6-2) were in the range of 0.60 (C.SocCap10_Freq) to 0.87 (C.SocCap2_Values) indicating a high correlation between the variables and their associated latent factors (Hair et al., 2010). There were some items with lower factor loadings, ranging from 0.52 to 0.60. These items and their factor loadings are shown in Table 6-2. The Cronbach's Alpha values for the relationship factors indicated an acceptable level of internal consistency. The majority of values were above 0.80 with only two factors with values below this.

Table 6-2: Constructs, items and exploratory factor analysis for relationship factors[26]

Construct and measures	Factor Loadings	Cronbach's Alpha	Composite[27] Reliability (CR)
1. Social capital Cognitive and Relational		**0.97**	**0.97**
C.SocCap2_Values	0.87		
R.SocCap5_Pers	0.87		
C.SocCap1_Goals	0.86		
R.SocCap7_Trust	0.86		
R.SocCap6_Recip	0.85		
R.SocCap4_Friend	0.85		
C.SocCap3_Bonds	0.85		
2. Social capital - structural		**0.91**	**0.91**
S.SocCap8_Funct	0.72		
S.SocCap9_Level	0.72		
C.SocCap10_Freq	0.60		
3. Supplier Value		**0.92**	**0.91**
Value5_ReduceCost	0.76		
Value7_ProdRisk	0.75		
Value6_Profit	0.74		
Value1_GrowBus	0.72		
Value3_NewTech	0.68		
Value4_Customer	0.68		
Value8_MktRisk	0.66		
Value2_Premium	0.65		
4. Costs and Risks		**0.91**	**0.91**
SuppCost7_ProdRisk	0.85		
SuppCost3_Incr	0.85		
SuppCost4_Stress	0.82		
SuppCost5_LessProfit	0.82		
SuppCost2_Flex	0.78		
SuppCost6_MktRisk	0.72		
5. Trust and Commitment		0.93	0.92
Trust5_Advantge	0.66		
Trust2_Welfare	0.66		
Trust1_Expl	0.66		
Trust4_Fair	0.65		
Trust6_Returns	0.63		
Trust3_Agree	0.63		
Commit1_RelLongTerm	0.57		
Commit3_Proud	0.57		
Commit2_Resource	0.52		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation. Rotation converged in eight iterations. Total variance explained by 11 factors 72%, All variables had communalities of greater than 0.5			

[26] The definition of these constructs can be found in Appendix - Table C: 1

[27] The value for composite reliability is derived from the CFA. It is presented here with Cronbach's Alpha as they both measure the internal consistency or the amount to which the measure of a construct are inter-related or measure the same thing (Hair et al., 2010).

Table 6-3: Constructs, items exploratory factor analysis for relationship factors - continued

Construct and measures	Factor Loadings	Cronbach's Alpha	Composite Reliability CR)
6. Supplier loyalty		**0.75**	**0.73**
CommitL3_PriceRev	0.76		
CommitL1_OptRev	0.71		
CommitL4_SpotMktR	0.70		
CommitL5_SuplOne	0.67		
7. Satisfaction with buyer		**0.91**	**0.91**
ProcAbi1_Mktg	0.78		
ProcAbil3_Prem	0.78		
ProcAbil2_SChain	0.78		
Satisf1_NetReturn	0.76		
Satisf3_Policies	0.68		
Satisf2_Support	0.64		
8. Satisfaction with price		**0.82**	**0.79**
Satisf10_PriceStock	0.74		
Satisf4_Price	0.73		
Satisf9_Ep$Expect	0.71		
Satisf5_PriceSched	0.65		
9. Satisfaction with communication		**0.88**	**0.87**
Satisf7_CommQuant	0.78		
Satisf8_CommQual	0.77		
Satisf6_Support	0.71		
10. Supplier specific assets		**0.81**	**0.85**
SpecInv3_Modify	0.82		
SpecInv2_Know	0.74		
SpecInv1_Reqs	0.72		
11. Buyer Power		**0.63**	**0.59**
Power1_Treat	0.79		
Power2_Favoured	0.76		
Power3_Profit	0.52		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation. Rotation converged in eight iterations. Total variance explained by 11 factors 72%, All variables had communalities of greater than 0.5.			

Table 6-4: Relationship factor scale items with low factor loading

Scale item	Description	Factor loading
Power3_Profit	Our [processor] has hinted that they would take certain action that would affect our profitability if we did not go along with their requests.	0.52
Commit1_RelLongTerm	We expect our relationship with our [processor] to continue for a long time.	0.57
Commit3_Proud	We are proud to tell other farmers we are a supplier to our [processor].	0.57
Commit2_Resource	We are willing to dedicate time, effort and resources to support our [processor] in growing their markets and sales.	0.52

Even though the items in Table 6-4 had low factor loading compared to the other factors, they were still considered acceptable due to the large sample size. Therefore these were retained in the analysis. Hair et al. (2010) states that, with a sample size of over 350, factor loadings as low as 0.30 are considered significant. Items with high cross loading were also removed from the analysis.

The EFA resulted in the scale items for cognitive social capital and relational social capital loading onto the same factor. This also occurred for the trust and commitment scale items (Table 6-2). This result signified that these variables were highly correlated and the EFA was not able to separate them into distinct factors. Furthermore, this suggests that the relational and cognitive dimensions of social capital (SC) may, in fact, form a single construct. This would represent the type or quality of the relationship connections whereas structural SC represented the structure of the connections. The fact that trust and commitment loaded onto a single factor also indicated that these constructs were also highly correlated and are difficult to separate as distinct factors. These issues were further evaluated in the CFA by testing for discriminant validity.

6.4.2 Analysis of supplier factors

The EFA for the supplier factors produced a nine-factor solution and explained 62% of the variance (Table 6-5). Scree plot for the factor analysis is shown in Figure B 2. The factor analysis resulted in nine factors when factors when Eigen value below one were excluded.

Table 6-5: Percentage of variance explained by supplier factors

	Rotation Sums of Squared Loadings		
Factor	**Total**	**% of Variance**	**Cumulative %**
1	3.2	10.1	10.1
2	3.0	9.4	19.5
3	2.8	8.7	28.2
4	2.0	6.1	34.3
5	1.9	5.9	40.2
6	1.8	5.8	46.0
7	1.8	5.6	51.6
8	1.7	5.3	56.9
9	1.7	5.2	62.2

The factor loadings ranged from 0.43 (SuppPerf8_QLMkt) to 0.91 (ProcDepend1). Most of the factor loadings were above 0.70 with only six items loadings below 0.60 (Table 6-7). All

factors had Eigen values greater than one, and the nine factors explained 62.5% of the variance.

These variables confirmed the validity of the scales developed from the literature and described in chapter five. Furthermore, they provided the measures for the latent constructs in the theoretical model, as shown in Figure 3-9. The factor loadings below 0.60 related to customer focus and supplier performance (Table 6-7). As with the relationship factor EFA, these values were still above the 0.30 level considered significant for large sample sizes (Hair et al., 2010) and therefore were retained in the analysis. The values of Cronbach's Alpha ranged from 0.68 (environmental uncertainty) to 0.91. (Supplier ability). These values were all above the value of 0.60 considered acceptable for exploratory research and close to the 0.70 cut off for more robust analysis.

Table 6-6: Constructs, items and exploratory factor analysis for supplier factors[28]

Construct and measures	Factor Loadings	Cronbach's Alpha	Composite Reliability (CR)
1. Supplier Ability		0.91	0.91
SuppAbil2_Mgmt	0.88		
SuppAbil3_Effic	0.87		
SuppAbil1_Quality	0.82		
SuppAbil4_Inn	0.82		
2. Customer Focus		0.80	0.83
Customer2_Soln	0.79		
Costomer1_Needs	0.79		
Customer4_know	0.63		
Customer3_Mod	0.61		
Customer7_Reqs	0.56		
Customer5_InnMkt	0.54		
3. Supplier performance		0.82	0.80
SuppPerf1_Farm	0.79		
SuppPerf2_QLStock	0.76		
SuppPerf3_Yield	0.69		
SuppPerf4_AWelfare	0.62		
SuppPerf5_NoPremium	0.56		
SuppPerf6_Effic	0.53		
SuppPerf7_ImpReturn	0.49		
SuppPerf8_QLMkt	0.43		
4. Self-direction		0.69	0.66
SelfDirect2_Prod	0.79		
SelfDirect1_Profit	0.78		
SelfDirect3_Constr	0.69		
5. Farm profitability		0.68	0.75
FarmPerf4_SatFin	0.89		
FarmPerf1_ProfitR	0.81		
FarmPerf3_SatProd	0.61		
6. Environmental uncertainty		0.68	0.69
UncertMkt2_Cust	0.80		
UncertMkt1_Comp	0.77		
UncertMkt3_Price	0.72		
7. Supplier dependence		0.85	0.80
SuppDepend2	0.89		
SuppDepend1	0.87		
8. Supplier communication		0.80	0.84
SuppComm_Inform2	0.86		
SuppComm_Inform1	0.82		
9. Processor dependence			
ProcDepend1	0.91	0.83	0.80
ProcDepend2	0.88		
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation. Rotation converged in six iterations. Total variance explained 62%			

[28] The definition of these constructs can be found in Appendix Table C: 1

Table 6-7: Supplier scale items with low factor loading

Scale item	Description	Factor Loading
SuppPerfF7_ImpReturns	Regarding yourself and your farm business. We continually try to improve our farm performance by achieving higher market returns for our products.	0.49
SuppPerf8_Cust_QLMarket	Our farm business operates in a market where above average quality is important.	0.43
SuppPerf5_NoPrem	We would aim to produce the best quality stock even if we were unable to get a premium for it.	0.56
SuppPerf6_Efficiency	We have consistently managed to improve our farm efficiency	0.53
Customer7_Reqs	We have made significant changes to our farming operation to better meet customer requirements.	0.56
Customer5_InnMkt	We are always looking for innovative ways to market our products.	0.54

Table 6-8 lists the common latent variables that were identified in the EFA and their internal consistency values. These factors match the constructs described in chapter four and the values for internal consistency indicated that the scale items for these constructs correctly identified the latent factors they were measuring.

Table 6-8: Common latent variables identified in the exploratory factor analysis

Relationship factors	**Cronbach's alpha**
Social capital - cognitive and relational	0.97
Social capital – structural	0.91
Supplier value	0.92
Costs and Risks	0.91
Trust and Commitment	0.93
Supplier loyalty	0.75
Satisfaction with buyer	0.91
Satisfaction with price	0.82
Satisfaction with communication	0.88
Supplier specific assets	0.81
Buyer power	0.63
Supplier factors	**Cronbach's alpha**
Supplier ability	0.91
Customer focus	0.80
Supplier performance	0.82
Self-direction	0.69
Farm profitability	0.68
Environmental uncertainty	0.68
Supplier dependence	0.85
Supplier communication	0.80
Processor dependence	0.83

6.4.3 Conclusion: Exploratory factor analysis

The results of these two EFA provided good evidence for uni-dimensionality of the constructs and confirmed the accuracy of the scale measures developed in chapter four. The EFA was able to use the scales items and identify a number of latent factors. These factors showed sufficient internal consistency to be used in the CFA. There were some latent variables that loaded onto the same factor. These were tested for discriminate validity in the CFA as outlined in the next chapter.

6.5 Measurement model and confirmatory factor analysis

This section describes the testing of the constructs using confirmatory factor analysis (CFA). This enabled further testing of how well the measured variables represent the latent constructs. This was undertaken using IBM® SPSS® Amos v22 software. The creation of a measurement model enabled testing of the measurement theory developed in the EFA by specifying the relationships between the measurement items and the latent constructs (Hair et al., 2010). In contrast to the EFA, the CFA requires the scale measures to be fixed in terms of the latent factors they load onto. In the CFA model, the measured indicator variables load onto the specified latent constructs, and the model shows the covariance between the latent constructs.

6.5.1 Testing of measurement model validity

The CFA was run to test for model fit as well as validity measures, including discriminant validity, convergent validity and reliability. The results of these tests indicate whether the measurement model is sufficiently valid to be used in the subsequent structural equation model (chapter 8).

According to Hair et al. (2010) measurement model validity depends on establishing an acceptable goodness-of-fit as well as finding evidence of construct validity. There are a number of fit indexes that are used to assess measurement model validity, although there is no one index that is more preferable. Because of this, several of the goodness-of-fit indexes were used to assess model fit. These are outlined in Table 6-9 with the relative advantages and disadvantages of each index discussed.

Table 6-9: Model fit criteria

Fit index	Acceptable Threshold	Description
Chi-square/df (cmin/df) Normed Chi-square	A low value of X^2 relative to degrees of freedom with an insignificant p value (p>0.05). Ratio should be less than 3:1.	Significant p values are expected with sample size over 250 and more than 12 observed variables (Hair et al., 2010).
Root Mean Square Error of Approximation (RMSEA)	Values less than 0.07 (Steiger, 2007). Values less than 0.05 represent excellent fit (Hair et al., 2010).	Has a known distribution and favours simple models?
Comparative Fit Indexes (CFI)	Values greater than 0.95.	Normed 0-1 range. Greater than 0.92 are acceptable for sample size above 250 and more than 12 observed variables (Hair et al., 2010).
SRMR	SRMR less than 0.08 (Hu & Bentler, 1999).	Standardised version of Root Mean Square Residual. Easier to interpret due to standardised value.
P Close	A non-significant value of P-close indicates a good fit > 0.05 (Kenny, 2015).	PCLOSE is a 'p value' for testing the null hypothesis that the population RMSEA is no greater than 0.05 (Browne, Cudeck, Bollen, & Long, 1993).

Adapted from (Hair et al., 2010; Hooper, Coughlan, & Mullen, 2008)

Amos software was used to evaluate construct validity and estimate the model fit for the measurement model. The model fit values for the measurement model for the relationship factors (Table 6-11) and supplier factors (Table 6-14) were all within the recommended range for good model fit. All the composite reliability (CR) scores were greater than 0.70, other than the CR for power.

6.6 Model modification

Model modification was used to improve model fit by making adjustments to the specification of the model. Considerable care was taken with this as Hair et al. (2010) cautions against attempting to improve model fit at the expense of being consistent with theory. In particular, reducing the number of items per construct needs to be well justified. Taking these warnings into account, model modification was undertaken only where it was felt there was theoretical justification and this was carefully documented together with the reasons for the modification.

6.6.1 Modification indices

Modification indices estimate the amount by which a model's Chi-Squared can be reduced when a constraint in the model that is fixed-to-zero (no correlation) is removed from the model and is freely estimated. The higher the modification index, the greater the improvement in overall fit that will be achieved by adding a path to the model. It is considered acceptable to co-vary the error terms for measures on the same latent construct.

Therefore, to improve model fit, high modification indexes were identified. Where these were between error terms that were on the same construct, a correlation path was introduced to improve model fit.

6.6.2 Standardised residuals

A residual is the difference between the covariance in the observed and estimated models. Standardised residuals enable comparisons between variables that have different units of measure (Byrne, 2000). Standardised residuals are similar to z-scores as they are calculated by dividing the residual by the standard error. They, therefore, represent the number the observed residuals are from zero, which would represent a perfectly matched model. Values greater than 2.58 are considered large and suggest a misfit of the model (Jöreskog, 1993).

6.6.3 Construct reliability and construct validity

The reliability and validity of the constructs were evaluated using the measurement model. Validity means the construct accurately measures what it is supposed to measure; reliability refers to the consistency and stability of the measurement of the construct. “Reliability is an inverse index of the measurement error” (Meyers et al., 2006, p. 721). Without establishing construct reliability and validity the results of the research are compromised. Reliability is most commonly measured by Cronbach’s Alpha. In addition to Cronbach’s Alpha, Construct Reliability (CR) is commonly used with SEM models as a measure of reliability. CR is squared sum of the factor loadings for each construct and the sum of the error variance.

$$\text{CR} = \frac{(sum\ of\ factor\ loadings)^2}{(sum\ of\ factor\ loadings)^2 + (sum\ of\ error\ variance)}$$

It therefore represents the percentage of variance due to the factor loadings in a similar way to Cronbach’s Alpha. Cronbach’s Alpha has been criticised for underestimating true reliability, however, quantitative analysis has shown that the difference was not of great significance (Peterson & Kim, 2013). In this research both Cronbach’s Alpha and construct reliability are reported (Table 6-2 and Table 6-3).

6.6.4 Discriminant validity

The latent variables were also tested for discriminant validity. This measures how different a construct is from the other constructs. Discriminant validity is demonstrated if the inter-correlations between the latent constructs are not too high. The approach of Kline (2005) and Hair et al. (2010) was used to evaluate discriminant validity (Table 6-10). This involved

comparing the average variance extracted (AVE)[29] for each of the two constructs with the square of the correlation between these constructs. The AVE should be greater than O.50 as this indicates that the latent factor explains more than 50% of the variance. The latent construct should also explain the items it measures better than it measures any other construct. Therefore, the squared correlation between the constructs, or average shared variance (ASV), should be greater than the average variance extracted (Hair et al., 2010).

6.6.5 Convergent validity

Convergent validity is based on the variance extracted by the construct (Table 6-10). The AVE should be above 0.50. This indicates that the construct converges, or the scale items share a high proportion of common variance (Hair et al., 2010). An AVE below 0.50 indicates that the variance explained by the construct is less than the error variance. The size of the factor loading is also an important consideration for convergent validity as high loadings indicate good convergence. Hair et al. (2010) recommend that all factor loadings should be statistically significant and individual loadings should be at least 0.50 and, ideally, greater than 0.70.

Table 6-10: Reliability and validity criteria for CFA

Reliability	**Critical ratio (CR) > 0.7**
Convergent Validity	Average variance explained (AVE) > 0.5 Statistically significant factor loadings Factor loading minimum 0.50 and ideally >0.70
Discriminant Validity	Maximum shared variance (MSV) < AVE Average shared variance (ASV) < AVE Square root of AVE greater than inter-construct correlations

(Hair et al., 2010)

6.7 Model fit for the measurement model

In this CFA model, supplier costs and risk and supplier benefits were combined to produce one factor that was labelled as supplier net value. This was calculated as supplier benefits minus supplier costs and risks. This was done to reduce the number of factors and to produce one construct that measured the perceived net value of the relationship. The relational and cognitive social capital constructs were left as one factor in accordance with the EFA results. Trust and commitment, however, were separated into discrete constructs in the model as there was good theoretical evidence that these were distinct constructs (Morgan & Hunt, 1994). These two factors would also be tested for discriminant validity in the CFA.

[29] This is the mean of the variance extracted by the items that load onto a factor.

6.8 Analysis of relationship factors

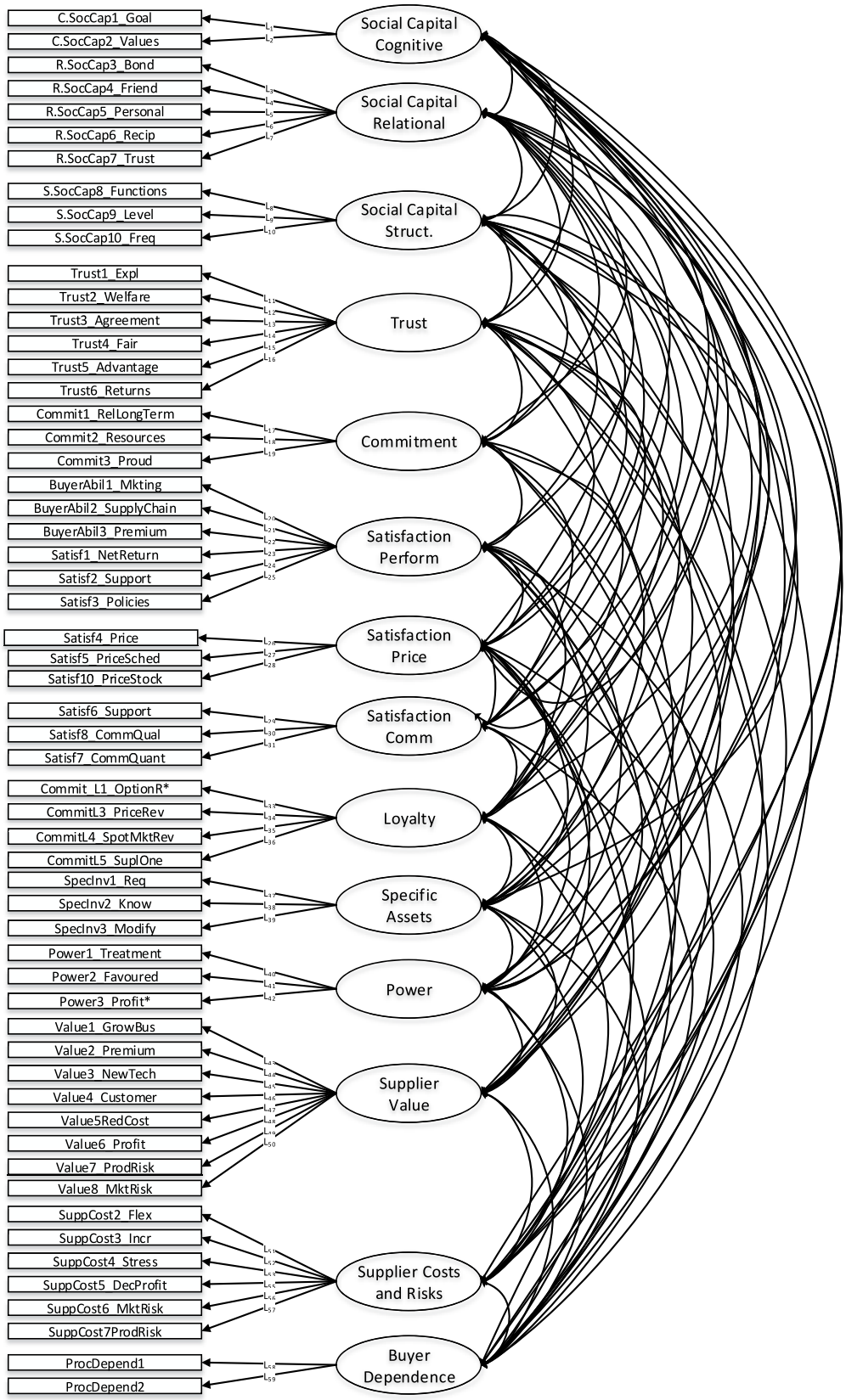

Figure 6-1: Measurement model - CFA for relationship factors[30]

[30] The definition of these constructs can be found in Appendix - Table C: 1.

The measurement model for the relationship factors (Figure 6-1) showed an excellent model fit. The model was within the threshold values on all the goodness-of-fit, except for GFI (Table 6-11).

Table 6-11: Model fit criteria for relationship factors

CFA Model Relationship Factors		
Measure	**Measurement Model**	**Threshold**
Chi-square/df (cmin/df)	2.76	< 3 good
CFI	0.94	> 0.95 great; >0.9 traditional
GFI	0.87	> 0.95
AGFI	0.85	> 0.80
RMSEA	0.04	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.99	> 0.05

Table 6-12: Measurement statistics (after item deletions)

	CR	**AVE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1. ProcDependence	0.81	0.68	**0.83**												
2. Trust	0.93	0.69	0.15	**0.83**											
3. SocialCap_RelCog	0.97	0.82	0.16	0.67	**0.91**										
4. Commitment	0.81	0.58	0.11	0.78	0.55	**0.76**									
5. Value	0.91	0.56	0.29	0.65	0.48	0.61	**0.75**								
6. Cost	0.91	0.64	0.13	-0.41	-0.19	-0.45	-0.26	**0.80**							
7. SatisfactionPerform	0.91	0.62	0.12	0.59	0.46	0.55	0.54	-0.32	**0.79**						
8. SocialCap_Stuct	0.91	0.77	0.27	0.65	0.58	0.52	0.61	-0.18	0.47	**0.88**					
9. SatisfactComm	0.87	0.69	0.03	0.55	0.45	0.53	0.44	-0.34	0.49	0.53	**0.83**				
10. SpecificInvest	0.85	0.65	0.36	0.13	0.14	0.16	0.42	0.29	0.10	0.32	0.05	**0.81**			
11. Loyalty	0.73	0.48	0.09	0.44	0.32	0.52	0.41	-0.40	0.32	0.34	0.34	0.12	**0.69**		
12. SatisfactionPrice	0.79	0.56	-0.05	0.63	0.41	0.48	0.52	-0.42	0.50	0.39	0.50	-0.11	0.24	**0.75**	
13. Power	0.59	0.42	0.29	-0.27	-0.14	-0.28	-0.02	0.56	-0.24	-0.04	-0.27	0.53	-0.22	-0.30	**0.65**

Notes (1) the diagonal entries express the variance extracted. The figures underneath the diagonal is the correlation between constructs.

There were a number of validity concerns where the criteria for discriminant and convergent validity were not met. The power construct initially had an AVE of 0.32 and a composite reliability score of 0.56. The loyalty construct initially had an AVE of 0.43. For both of these, the square root of the AVE was less than the absolute value of the correlation with another factor. The decision was made to delete some items to improve discriminant validity. The item deletions were based on measures with low factor loadings. Power1_Treat with loading of 0.54 was removed from the power construct and CMT_L1OptR with weighting of 0.54 deleted from loyalty (Table 6-12).

Table 6-13: Validity concerns in relationship constructs

Construct	Validity concern
Loyalty	Convergent Validity: the AVE for loyalty is less than 0.50.
Power	Reliability: the CR for Power is less than 0.70. Convergent Validity: the AVE for power is less than 0.50.

Following these deletions there were still some validity concerns (Table 6-13). Although these concerns remained, Hair et al. (2010) emphasise that the thresholds rules were only guidelines and suggests that more flexibility was acceptable especially when undertaking exploratory research. Following the deletions, loyalty had an AVE of 0.48, which was just below the suggested cut off of 0.5. In a similar way, power had an AVE of 0.42, which was significantly closer to the 0.50 cut off than before the item deletions (Table 6-2). Power also had a composite reliability score of 0.59, which was substantially lower than the 0.70 recommended. This indicated that there were some validity issues with the power construct and it was only suitable to be used in exploratory research and therefore should be treated with caution in making definitive predictions. The commitment construct also had some issues with discriminant validity; however, this was because of the high correlation between commitment and trust, which was 0.78. The square root of the AVE for commitment was 0.74, which was close to the value of the correlation between trust and commitment. These values indicate that the criteria for discriminant validity is close to being met.

6.8.1 Analysis of supplier factors

The measurement model for supplier factors (Figure 6-2) also had excellent model fit in meeting the levels for all the model fit criteria (Table 6-14).

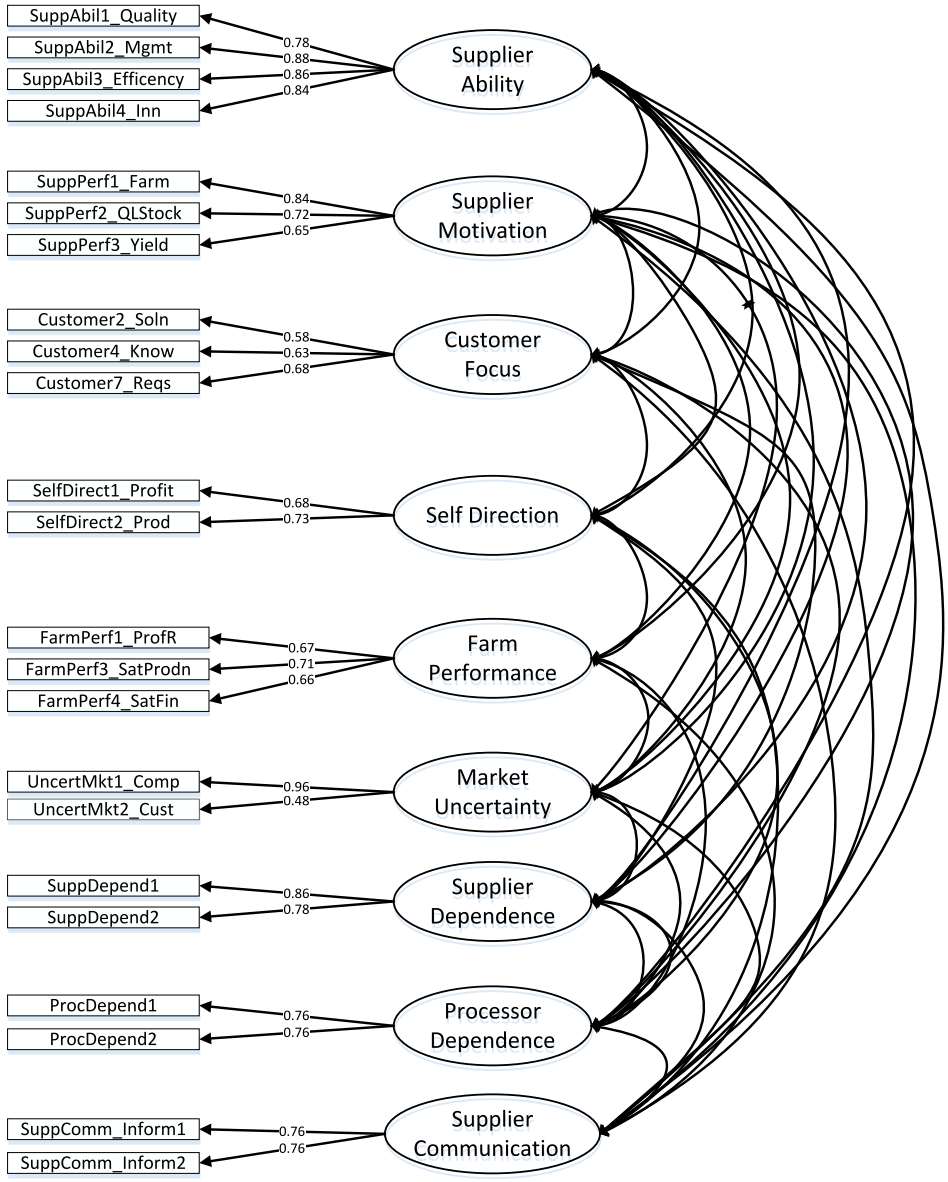

Figure 6-2: Measurement model supplier factors[31]

Table 6-14: Model fit criteria for supplier factors

CFA Model Supplier Factors		
Measure	**Measurement Model**	**Threshold**
Chi-square/df (cmin/df)	2.99	< 3 good
CFI	0.93	> 0.95 great; >0.9 traditional
GFI	0.93	> 0.95 (>0.90 ok)
AGFI	0.91	> 0.80
RMSEA	0.046	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.98	> 0.05

[31] The definition of these constructs can be found in Appendix - Table C: 1.

Table 6-15: Shared variance, variance extracted and correlations between constructs for the supplier factors (before item deletions)

	CR	AVE	1	2	3	4	5	6	7	8	9
1. ProcDependence	0.78	0.64	**0.80**								
2. SuppMotivation	0.81	0.38	0.13	**0.62**							
3. SupplierAbility	0.91	0.71	0.14	0.47	**0.84**						
4. CustomerFocus	0.81	0.48	0.19	0.38	0.24	**0.70**					
5. SelfDirect	0.69	0.43	0.13	0.11	-0.15	-0.01	**0.66**				
6. SupplierProfit	0.75	0.53	0.01	-0.10	-0.01	0.04	-0.11	**0.72**			
7. SupplierComm	0.84	0.73	0.22	0.38	0.24	0.34	0.00	0.02	**0.85**		
8. MarketUncertanty	0.68	0.42	0.19	0.20	0.07	0.23	0.12	0.01	0.13	**0.65**	
9. SuppDependence	0.80	0.67	0.21	0.13	-0.01	0.12	0.24	-0.07	0.29	0.09	**0.82**

Notes (1) the diagonal entries express the variance extracted, the figures underneath the diagonal is the correlation between constructs.

Table 6-16: Validity concerns supplier constructs (before item deletions)

Construct	Validity concern
Supplier Motivation	Convergent Validity: the AVE for supplier motivation is less than 0.50.
Customer Focus	Convergent Validity: the AVE for customer focus is less than 0.50.
Self- direction	Reliability: the CR for self-direction is less than 0.70. Convergent Validity: the AVE for self-direction is less than 0.50.
Market Uncertainty	Reliability: the CR for market uncertainty is less than 0.70. Convergent Validity: the AVE for market uncertainty is less than 0.50.

The data in Table 6-15 identified some validity issues (Table 6-15). Reliability was an issue for both self-direction and market uncertainty, although the composite reliable value for self-direction was 0.69 and the value for market uncertainty was 0.68, both of which were very close to the composite reliability threshold of 0.70 indicating that they both have reasonable reliability. There were convergent validity issues for customer focus, supplier motivation, self-direction and market uncertainty. The value for customer focus was 0.48, which was very close to the 0.50 threshold and, therefore, not a significant issue. However, the values for supplier motivation, self-direction and market uncertainty were all below 0.44, with the lowest being supplier motivation. As a result, items were considered for deletion on these constructs based on low factor loadings. One item was deleted from the self-direction construct. This item was “Selfdirect3_Constraint” (factor loading: 0.58). Deleting this increased AVE from 0.43 to 0.49. One item was deleted from the market uncertainty construct. This was “UncertMkt3_Price” (factor loading: 0.55) and this increased AVE from 0.42 to 0.55. Two items were deleted from supplier motivation construct; these were

"SuppPerf4_AWelfare" (factor loading: 0.51) and SuppPerf5_NoPremium (factor loading: 0.46), which increased the AVE for from 0.38 to 0.45 (Table 6-17).

Table 6-17: Shared variance, variance extracted and correlations between constructs for supplier factors (after item deletions)

	CR	AVE	1	2	3	4	5	6	7	8	9
1. SupplierDependence	0.78	0.64	0.80								
2. SuppMotivation	0.80	0.45	0.14	0.67							
3. SupplierAbility	0.91	0.71	0.14	0.49	0.84						
4. CustomerFocus	0.83	0.56	0.19	0.38	0.24	0.75					
5. SelfDirect	0.66	0.49	0.13	0.16	-0.12	0.01	0.70				
6. SupplierProfit	0.75	0.53	0.01	-0.10	-0.01	0.04	-0.11	0.73			
7. SupplierComm	0.84	0.73	0.22	0.36	0.24	0.33	0.01	0.02	0.85		
8. MarketUncertainty	0.69	0.55	0.20	0.15	0.08	0.21	0.09	0.04	0.11	0.74	
9. SupplierDependence	0.80	0.67	0.21	0.13	-0.01	0.12	0.22	-0.06	0.29	0.05	0.82

Table 6-18: Validity concerns following item deletions

Construct	Validity concern
Supplier motivation	Convergent Validity: the AVE for supplier motivation is less than 0.50
Self-direction	Reliability: the CR for self-direction is less than 0.70. Convergent Validity: the AVE for self-direction is less than 0.50.
Market uncertainty	Reliability: the CR for market uncertainty is less than 0.70.

Following the item deletions, there were still some validity concerns even though most values had significantly increased (Table 6-18). Supplier motivation had an AVE of 0.45, still below the 0.50 cut off. In contrast, self-direction had AVE of 0.49, which was very close to .50. There were reliability issues for both self-direction and market uncertainty. This was only an issue for self-direction with a composite reliability score of 0.66. The score for market uncertainty was 0.69, which was only marginally below the 0.70 cut off.

Following the deletion of these items the validity of the model was considered acceptable. This was on the basis of the assertion of Malhotra and Dash (2011) who noted that, "AVE is a more conservative measure than CR. On the basis of CR alone, the researcher may conclude that the convergent validity of the construct is adequate, even though more than 50% of the variance is due to error" (Malhotra and Dash, 2011, p.702). Furthermore, Ping (2007) explains that a low AVE may be acceptable for first time exploratory models that are incorporating new measures.

6.8.2 Invariance testing

Appendix C presents the data from the analyse (invariance test) to see if the model produced the same results across the sheep beef and venison groups. If the constructs do not meet the test of invariance then they may be measuring different latent constructs for each group. This showed that the factor structure and loadings are sufficiently equivalent across the three groups.

6.8.3 Conclusion: Confirmatory factor analysis

This chapter presents the results of the CFA. The majority of the constructs showed sufficient discriminant and convergent validity as well as reliability. There were some latent factors that did not meet these criteria. These were addressed by deleting some items with low factor loadings. Following these item deletions there was a significant increase in these variables, however there were still some marginally below the recommended values. These were considered to be acceptable to use in the SEM.

Chapter 7: Data analysis – structural equation modelling

7.1 Introduction

This chapter addresses the objectives of the research, as outlined in section 1.4.1. These objectives aim to determine how supplier characteristics and relationship attributes contribute to both relationship quality and supplier performance. It also seeks to clarify the measurement of relationship quality in relation to social capital. The results also identify the role played by relationship quality in mediating the interactions between supplier characteristics, the relationship attributes and supplier performance.

7.2 Structural equation modelling

There are a number of software packages available for SEM, including LISREL, EQS and AMOS. IBM SPSS AMOS v 22.0 was used for this study because of the ease of use, the graphical interface and the ability to organise the output through Microsoft Windows programs (Byrne, 2000).

7.3 Relationship quality: Definition and measurement

The definition of relationship quality and its measurement was a key part of the research objectives. One specific aspect of this was to clarify the relationship between social capital (SC) and relationship quality (RQ). As discussed in the literature review, social capital is closely related to relationship quality. This link can be seen by evaluating the scale items that researchers have used to measure SC. Those used for cognitive and relational social capital are closely aligned to measurements of relationship quality (Villena et al., 2011). This research tested four different models involving relationship quality and social capital. These were:

- Relational/cognitive and structural social capital are dimensions of relationship quality along with trust, commitment and satisfaction (Model 1 - Figure 7-1).
- Relationship quality and social capital are separate and distinct constructs (Model 2 - Figure 7-2).
- Social capital is a sub-dimension of relationship quality (Model 3 - Figure 7-3).
- Relationship quality is a sub-dimension social capital (Model 4 - Figure 7-4).

7.3.1 Structure of the relationship quality construct

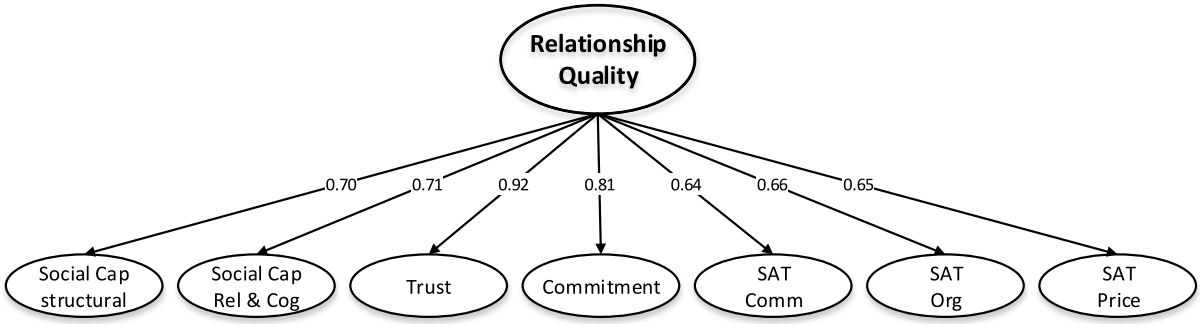

Figure 7-1: Model 1 - lower order relationship quality construct

Model 1 (Figure 7-1) is a second order factor model with all the relationship quality and social capital dimensions loading onto relationship quality. This model hypothesises that relational, structural and cognitive social capital are additional sub-dimensions of relationship quality. The values on each arrow represent standardised regression coefficients between the lower order constructs and relationship quality. All these values were above the recommended cut-off of 0.50 and were significant at $p<0.001$ (Table C: 2). Trust and commitment had the highest factor loading which was consistent with the fact that these two variables were the most commonly used variables for relationship quality. The SC constructs also have a high factor loading indicating that these were closely related to relationship quality. The satisfaction variables had the lowest factor loadings. Although the value of these factor loading was acceptable, it may suggest that satisfaction is less directly related to relationship quality. In other words, it may be possible to have low satisfaction and still have high relationship quality.

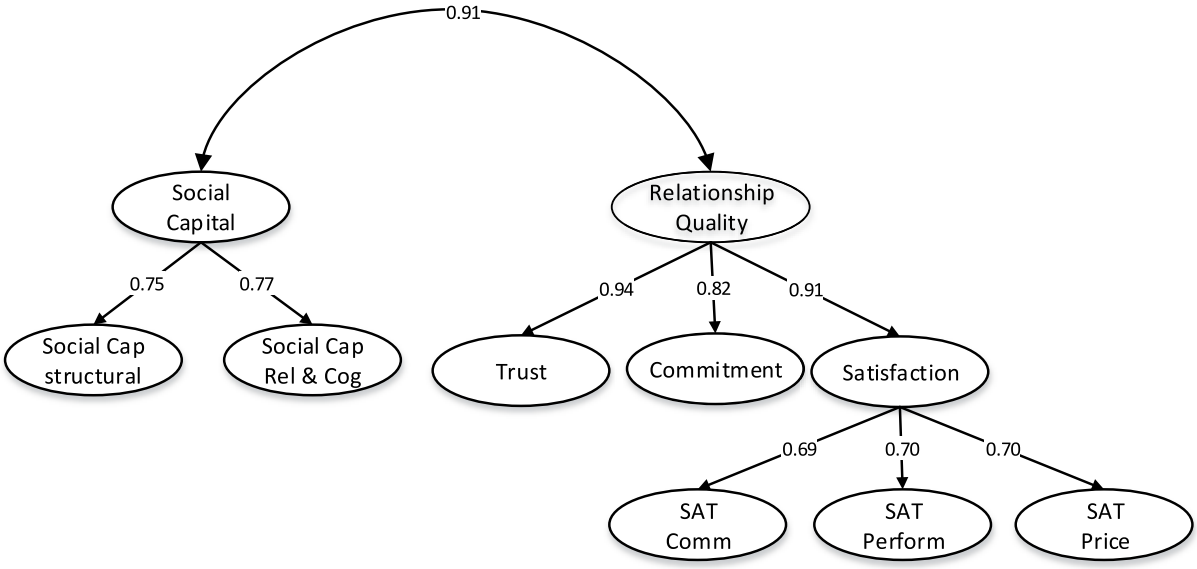

Figure 7-2: Model 2 - higher order model social capital and relationship quality constructs

Model 2 assumes that SC and RQ are distinct constructs. This assumption was tested the using a CFA model. This identified the factor loading and covariance between social capital and relationship quality (Figure 7-2). The high correlation between social capital and relationship quality (0.91) indicated that these constructs were highly related.

Table 7-1: Discriminant validly analysis between relationship quality and social capital

Construct	CR	AVE	MSV	ASV	Correlation Matrix	
					Relationship quality	Social capital
Relationship quality	0.92	0.80	0.84	0.42	0.89	
Social capital	0.73	0.58	0.84	0.43	0.91	0.76
AVE = Average variance explained MSV = Maximum shared variance CR=Critical ratio. ASV = Average shared variance.						

Table 7-2: Validity issues for Model 2

Discriminant validity	The square root of the AVE for relationship quality is less than one the absolute value of the correlations with social capital.
	The square root of the AVE for social capital is less than the absolute value of the correlations for relationship quality.
	The AVE for relationship quality is less than the MSV.
	The AVE for social capital is less than the MSV.

The two constructs did not meet the criteria for discriminant validity (Table 7-1) and therefore should not be treated as distinct latent factors (Table 7-2).

Two further models were evaluated Model 3 (Figure 7-3) and Model 4 (Figure 7-4). Model 3 treated social capital as a sub-dimension of relationship quality whereas Model 4 proposed that relationship quality was a sub dimension of social capital.

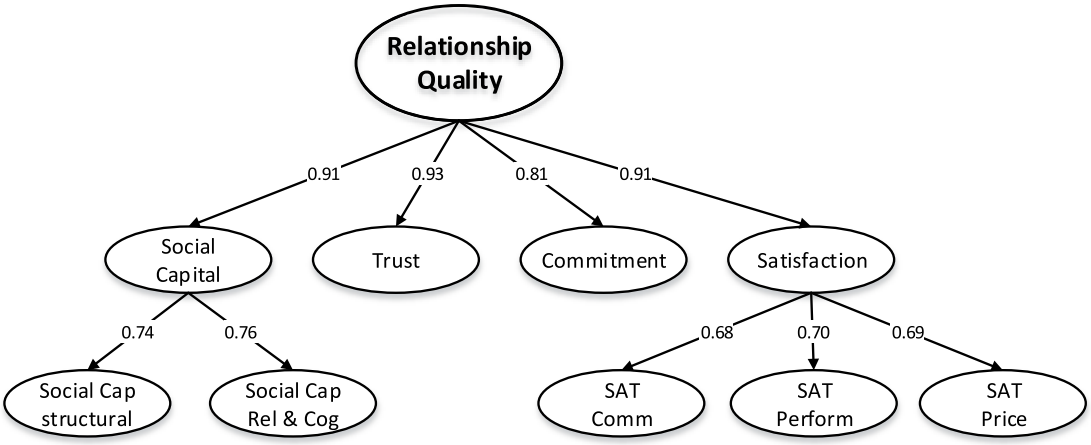

Figure 7-3: Model 3 - higher order relationship quality mode

Model 3 had high factor loading for all the dimensions of relationship quality (Figure 7-3), ranging from 0.81 for commitment, to 0.93 for trust. This result was similar to model four with factor loading ranging from 0.72 for relational/cognitive social capital, to 0.91 for relationship quality.

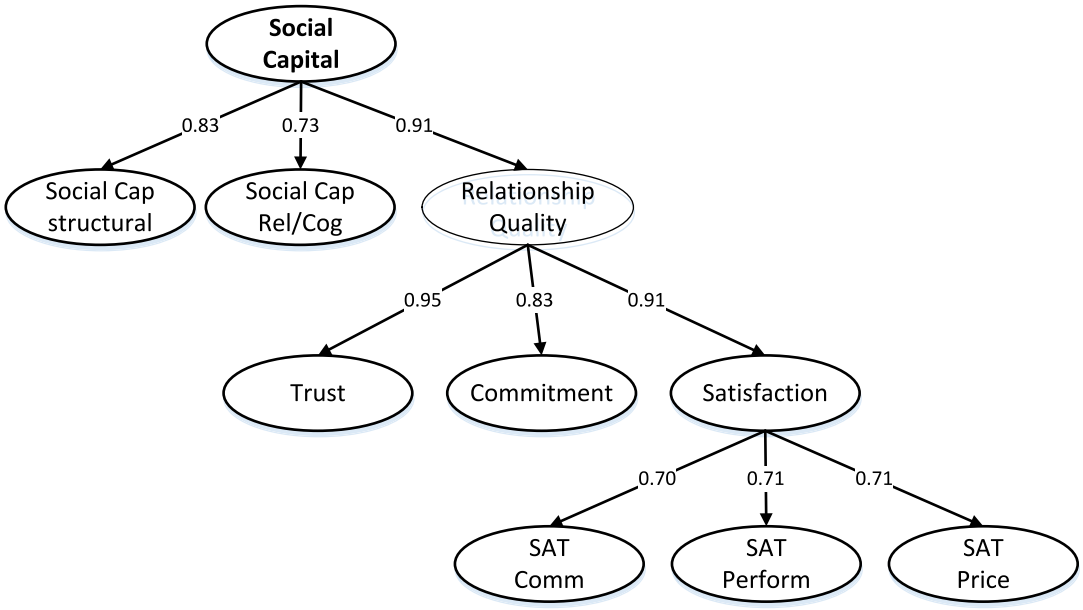

Figure 7-4: Model 4 - social capital as a higher order construct

Table 7-3: Model fit criteria comparing different models

Measure	Model 1: Lower order model	Model 2: RQ and SC distinct constructs	Model 3: SC dimension of RQ	Model 4 RQ dimension of SC	Threshold
Chi-square/df (cmin/df)	3.6	3.5	3.5	3.8	< 3 good
CFI	0.96	0.96	0.96	0.96	> 0.95 great; >0.9 traditional
GFI	0.90	0.91	0.91	0.89	> 0.95 good
AGFI	0.89	0.89	0.89	0.88	> 0.80 good
RMSEA	0.05	0.05	0.05	0.54	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.14	0.28	0.28	0.01	> 0.05 good

Comparing the four different models based on model fit indexes (Table 7-3) revealed that there was little difference between the models in terms of model fit other than for Model 1 and 4. Model 4 had the lowest goodness-of-fit values of all the models. Model 1 also had a lower goodness-of-fit compared to model two and three. This shows that Model 1 and 4 explained less of the variance in the data than the other two models. All four models had acceptable fit indexes which suggest that any of the models could be justified based on goodness-of-fit. This result explains why the concept of relationship quality, as described in the literature, is a complex, multifaceted and a somewhat elusive construct (Crosby et al., 1990; Garvin, 1984). This was especially so when SC was incorporated with RQ.

What this suggested is, firstly, that there are multiple ways of conceptualising relationship quality and social capital and that no one structure emerging as significantly more accurate than another. Secondly, that social capital is a closely related construct to relationship quality. There was some evidence that SC was a dimension of RQ rather than a separate and independent construct (or vice versa).

To determine which model to incorporate into the SEM model, the perspective of Hair et al. (2010) was used in which the ultimate criterion for determining a higher order model was theory. This perspective also meant that simpler lower order models should be chosen unless there were strong theoretical and empirical reasons for choosing a higher order model. Based on this criterion, Model 3 was selected as the preferred model as it had one of the best goodness-of-fit and relatively simple structure. Model 1 was rejected as it had lower goodness-of-fit indicators and lower factor loading. Model 2 was also rejected, as it assumed SC and RQ were separate constructs, but this was not supported by the lack of discriminant validity (Table 7-2) and the high standardised correlation of 0.91. Model 3 had less

complexity than Model 4 with a second order model structure (Figure 7-3). This model assumed that social capital was a dimension of relationship quality.

7.3.2 Theoretical model of supplier performance

This next section tests the theoretical model developed from the literature review and the confirmatory factor analysis. This model represents the concept that the antecedents of supplier performance are the relationship attributes and supplier characteristics, and that these were mediated by relationship quality. This model represents the hypotheses, H5 – H13, as described in Table 7-2. The null hypothesis is that there is no mediation by relationship quality and, therefore, supplier performance had only direct relationships with supplier characteristics and relationship attributes. The role of relationship quality in mediating supplier performance was evaluated by testing the theoretical model with and without mediation by relationship quality.

7.4 Model testing with and without mediation

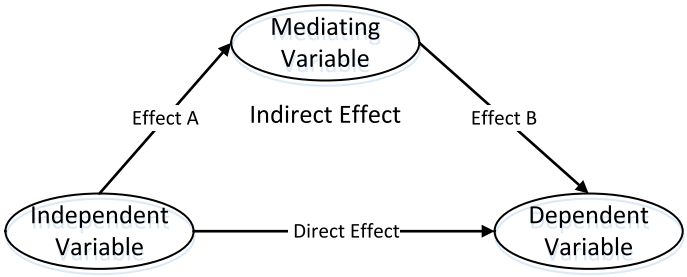

Figure 7-5: Model of the direct effects and indirect effects through a mediating variable

Figure 7-5 explains the relationship between the direct and mediated (indirect effects) on the dependent variable. Hair et al. (2010) define mediation as when a third variable (mediator) intervenes between two other related variables. The theoretical model (Figure 3-9) was initially tested with full mediation by relationship quality (Figure 7-7), then tested with only direct effects (Figure 7-8). Following this, a model was created with both direct and indirect effects. This enabled the degree of mediation by relationship quality to be established. To achieve this, the effect of mediation was evaluated based on how the direct effects changed with the presence of the mediator. If there was no change, then there was no mediation. If the direct effect changed, but it was still statistically significant, then partial mediation occurred. If the direct effect lost its significance entirely in the presence of the mediator, then full mediation occurred. Finally, an indirect effect occurred where there was

no statistically significant direct effect, but a significant indirect effect occurred through the mediator.

Testing the theoretical model involved a five-step process. Firstly, in Model 1 (Figure 7-6), all the supplier and relationship variables were tested loading onto relationship quality. The statistically significant paths identified which of these variables were antecedents of relationship quality. Testing this model was important theoretically as it contributed to an understanding of supplier and relationship factors that influenced relationship quality. It is also of value to practitioners who desired to improve relationship quality among their suppliers. Secondly, Model 2 (Figure 7-7), was tested with full mediation by relationship quality and no direct effects. Thirdly, Model 3 (Figure 7-8) represented the null hypothesis where all the supplier and relationship variables loaded directly onto the supplier performance constructs with no mediation by relationship quality. Fourthly, in model 4 mediation by relationship quality was tested in the presence of the direct effects (Figure 7-9); this, in effect, combined Models 2 and 3. Model four enabled the mediated (indirect effects) of relationship quality to be identified. Also, this revealed how the direct effects changed when relationship quality was included in the model. Finally, by identifying the significant paths in model four and removing any non-significant paths, the antecedents for each of the supplier performance variables could be specified including both the mediated and direct effects. Model five represents this re-specified mode (Figure 7-10). Each model was compared based on goodness-of-fit criteria. Comparing these rival models was based on the growing consensus among structural equation modelling practitioners that rival models should be compared rather than just the one model proposed (Bollen & Long, 1992; Morgan & Hunt, 1994).

7.4.1 Structural Model 1: Antecedents of relationship quality

Model 1 identified which of the independent variables were antecedents of relationship quality. This was achieved by testing the strength and significance of the supplier and relationship variables with relationship quality as the dependent variable.

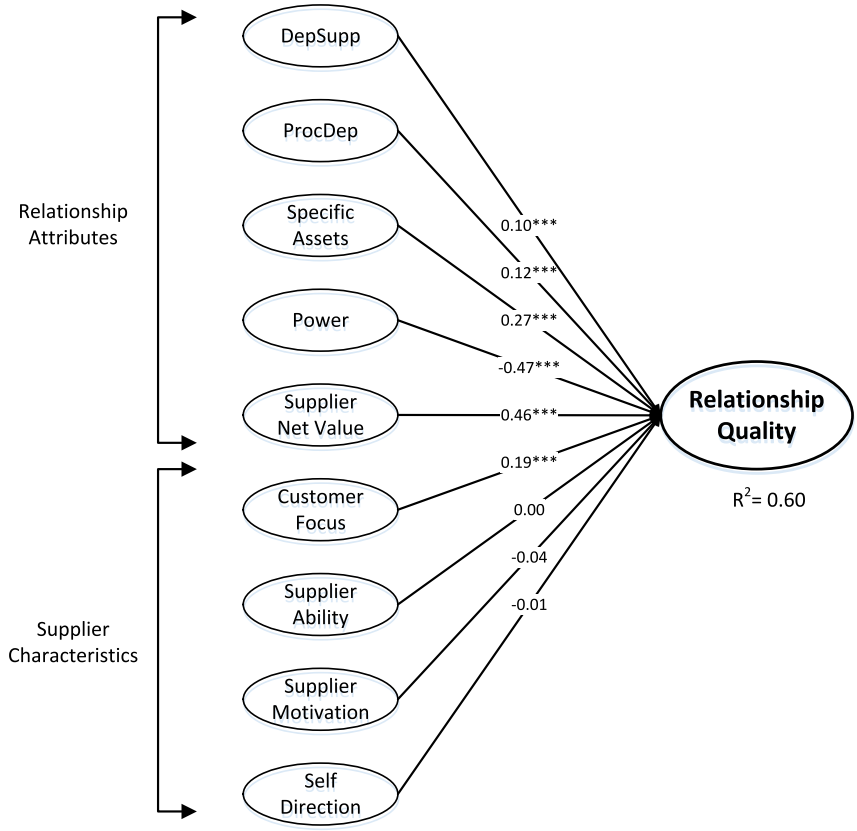

Figure 7-6: Model 1 - antecedents of relationship quality

Table 7-4: Model fit criteria for Model 1 - antecedents of relationship quality

Measure	Structural model relationship quality	Threshold
Chi-square/df (cmin/df)	4.6	< 3 good
CFI	0.96	> 0.95 great; >0.9 traditional
GFI	0.98	> 0.95 good
AGFI	0.93	> 0.80 good
RMSEA	0.06	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.24	> 0.05 good

Table 7-5: Standardised effects of antecedents of relationship quality

Variable	Relationship quality
Supplier dependence	0.10***
Processor dependence	0.12***
Specific assets	0.27***
Power	-0.47***
Supplier net value	0.46***
Customer focus	0.19***
Supplier ability	0.00 (ns)
Supplier motivation	-0.04 (ns)
Self-direction	-0.01 (ns)

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

The results of the structural equation Model 1 demonstrated a reasonable model fit (Table 7-4). The model met, or was close to meeting, all the model fit criteria. Furthermore, the supplier and relationship variables explained 60% of the variance in relationship quality (R^2 = 0.60). This result indicates that these antecedent variables explain a considerable amount of the variation relationship quality. However, nearly all of the significant antecedent variables were relationship attributes (Table 7-5). Customer focus was the only supplier characteristic that was a significant antecedent to relationship quality. The remaining supplier characteristics including supplier ability, motivation and self-direction had small, non-significant effects on relationship quality. This suggests that the characteristics of suppliers had little effect on relationship quality other than their level of customer focus. Relationship quality is therefore primarily affected by the attributes of the relationship with the processor, including dependence, specific assets, power and net value. Therefore, buyers seeking to improve the quality of their relationships with suppliers needed to focus on the relationship attributes rather than supplier's characteristics.

Supplier net value had the strongest effect on relationship quality (0.46***). Suggesting that experiencing positive value from the relationship is a fundamental driver of relationship quality. These benefits and costs are not directly financial but involved such things as access to new technology, reduction of production costs, access to premium markets and reducing risk and uncertainty in production and product marketing. The costs and risks included such things as reduced flexibility, increased uncertainty in marketing, greater production risk and increase in production costs as well as increased management effort and stress.

Supplier and processor dependence, specific assets all had a positive impact on relationship quality with power having a substantial negative impact (Table 7-5). All these relationship variables were also somewhat related. For example, there was a significant correlation between specific assets and supplier dependence (0.49***), processor dependence and supplier dependence (0.10***), power and specific assets (0.68***).

7.4.2 Structural Model 2: Indirect effect fully mediated by relationship quality

Structural Model 2 hypothesised that there was full mediation by relationship quality with no direct effects. These relationships are presented in Figure 7-7 and Table 7-6. The input values to relationship quality in this model were the same values as in Model 1. As these represented the antecedents of relationship quality, the value of these did not change across the different models.

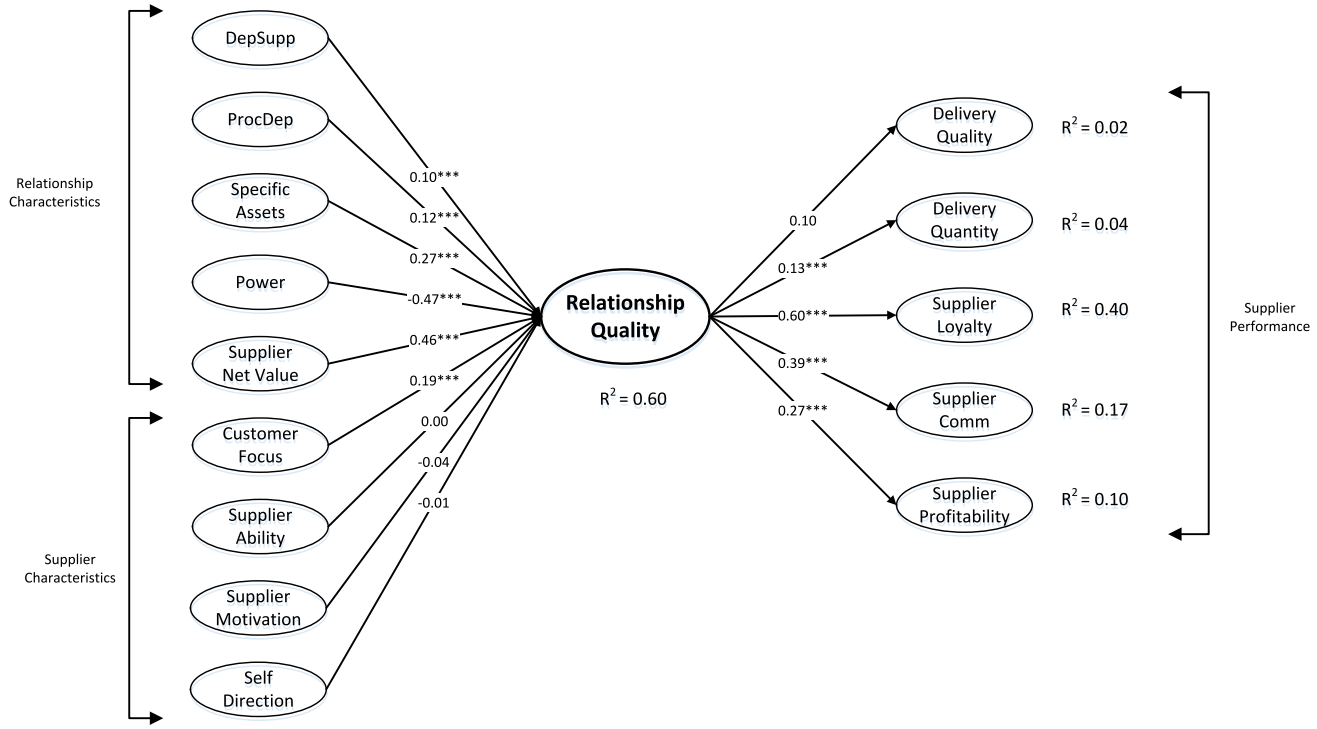

Figure 7-7: Model 2 - full mediation

The results for Model 2 showed that relationship quality had a number of significant effects on the supplier performance variables (Table 7-6). Relationship quality was an antecedent to supplier loyalty, supplier communication, supplier profitability and delivery quantity. This was evidence that relationship quality is an important antecedent for supplier performance. It influenced supplier loyalty and communication, as well as supplier profitability and delivery quantity. This model showed reasonable model fit although all the variables were outside the recommended cut off criteria (Table 7-7).

Table 7-6: Model 2 - mediated effects (relationship quality on supplier performance variables).

Supplier performance variable	Relationship quality
Supplier communication	0.39***
Supplier profit	0.28***
Loyalty	0.60***
Delivery quality	0.10**
Delivery quantity	0.13***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table 7-7: Model fit for mediated model 2 (indirect effects only)

Measure	Structural Model (mediated)	Threshold
Chi-square/df (cmin/df)	5.5	< 3 good
CFI	0.82	> 0.95 great; >0.9 traditional
GFI	0.91	> 0.95 good
AGFI	0.87	> 0.80 good
RMSEA	0.068	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.00	> 0.05 good

Table 7-8: Squared multiple correlations (R^2) for the mediated model (indirect effects)

Supplier performance variables	Estimate (R^2)
Supplier communication	0.17
Supplier profit	0.10
Loyalty	0.40
Delivery quality	0.02
Delivery quantity	0.04

The (R^2) values were low for delivery quality, delivery quantity. In contrast, supplier communication, profitability and loyalty had higher values. This suggests that relationship quality does not significantly affect the quality variables. Furthermore, the model fit criteria for this model were close but not within the fit criteria. This suggests that this model was not a good representation of the data. This may be because a number of these effects were direct with no mediation. This will be analysed with the subsequent the models.

7.4.3 Structural Model 3: Direct effects without mediation

As already explained, testing the theoretical model required evaluating the model for direct effects with and without any mediation by relationship quality. Structural Model 2 (Figure 7-8) evaluated only a fully mediated model with only indirect effects of the supplier and the relationship variables on supplier performance. Model 3 represents the null hypothesis where each of the independent variables loaded directly onto each of the supplier performance variables.

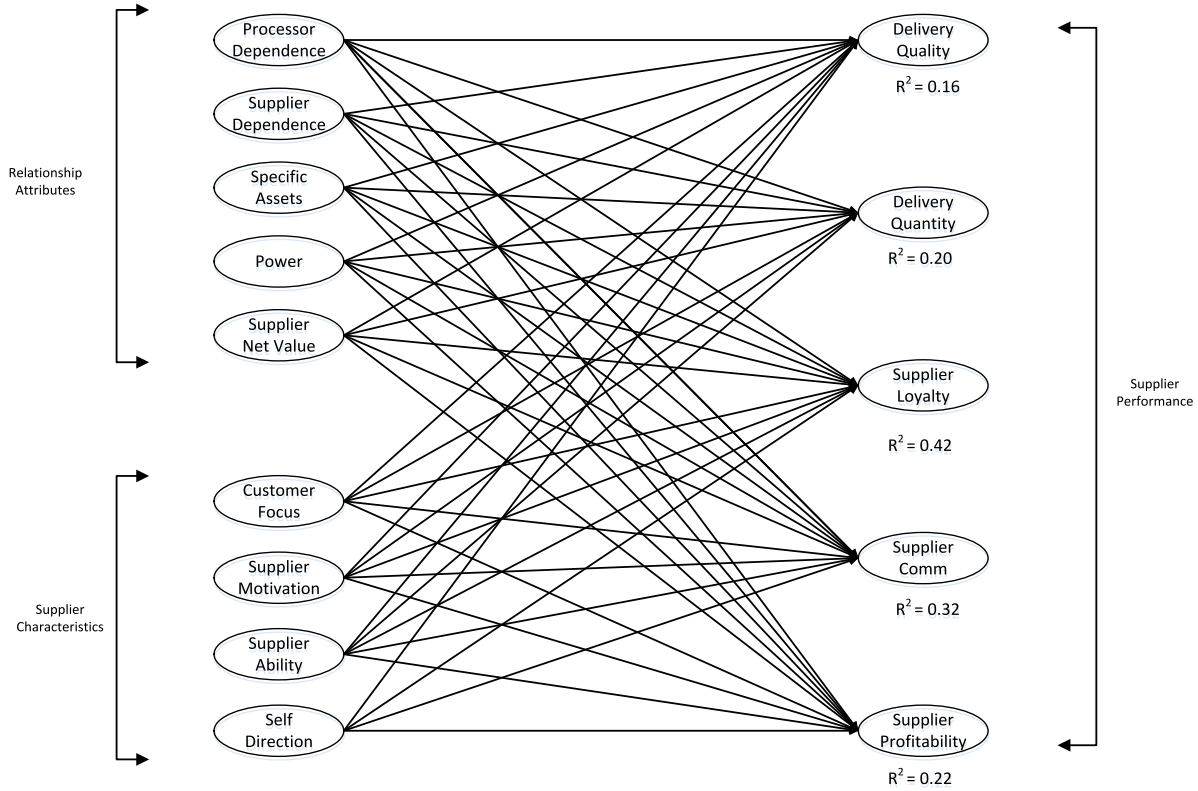

Figure 7-8: Model 3 - unmediated direct effects

Table 7-9: Model fit for unmediated model 3 (direct effects only)

Measure	Structural Model 3 (unmediated)	Threshold
Chi-square/df (cmin/df)	3.4	< 3 good
CFI	0.93	> 0.95 great; >0.9 traditional
GFI	0.96	> 0.95 good
AGFI	0.92	> 0.80 good
RMSEA	0.05	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.46	> 0.05 good

Table 7-10: Squared multiple correlations (R^2) for unmediated model (direct effects)

Supplier performance variable	Estimate (R^2)
Supplier communication	0.32
Supplier profit	0.22
Loyalty	0.42
Delivery quality	0.20
Delivery quantity	0.16

The results of testing the unmediated model showed a substantial increase in the R^2 values compared to the mediated model (Table 7-13). The R^2 values now ranged from 0.16 for delivery quality, to 0.42 for supplier loyalty, implying that these variables explained between 16 to 42% of the variation in the supplier performance variables (Table 7-10). Delivery quality and quantity had the greatest increase in R^2 values. Supplier communication and profitability also had meaningful increases. In contrast, loyalty had only a small increase. This result indicates there were likely to be significant indirect effects between these variables and supplier performance. Furthermore, there was a substantial improvement in model fit. There was now an acceptable model fit (Table 7-9) with all the model fit indices within or close to the model fit criteria. This was evidence that there were significant indirect effects that affected supplier performance independent of relationship quality.

Table 7-11: Model 3 - standardised direct effects (without relationship quality as mediator)

	Relationship attributes					**Supplier characteristics**			
	Supplier ability	**Supplier dependence**	**Processor dependence**	**Specific assets**	**Power**	**Supplier net value**	**Supplier motivation**	**Self-direct**	**Customer focus**
Supplier communication	**0.23*** **	**0.11** **	0.05 (ns)	**0.16*** **	0.06 (ns)	0.00 (ns)	**0.26*** **	-0.01 (ns)	**0.15*** **
Supplier profit	**0.24*** **	**-0.16*** **	0.05 (ns)	0.03 (ns)	**-0.10***	0.02 (ns)	**-0.15*** **	**0.17*** **	0.01 (ns)
Supplier loyalty	**0.31*** **	**0.20*** **	-0.01 (ns)	**0.22*** **	**-0.42*** **	0.03 (ns)	0.03 (ns)	**0.08** **	0.03 (ns)
Delivery quality	0.04 (ns)	0.06 (ns)	-0.04 (ns)	0.04 (ns)	0.01 (ns)	**0.11*** **	**0.21*** **	**-0.18*** **	**0.09***
Delivery quantity	0.07 (ns)	0.04 (ns)	-0.02 (ns)	0.02 (ns)	0.03 (ns)	**0.11 *** **	**0.23*** **	**-0.13*** **	0.00 (ns)

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *. Values in bold represent significant effects on supplier performance variables p<0.01.

Table 7-11 demonstrates the strength and significance of the unmediated direct effects tested in Model 3. This showed there were a number of significant direct effects between the supplier and relationship variables and supplier performance. These ranged from -0.42*** for the influence of power on supplier loyalty to 0.09* for the effect of customer focus on delivery quality.

There were significant differences in the number and strength of the relationship and supplier variables affecting supplier performance. For example, processor dependence had no direct effect on any of the supplier performance variables, whereas supplier motivation and self-direction had the greatest impact, affecting four of the five supplier performance variables. The direction of the effects was also not always consistent. Some factors (supplier motivation, supplier dependence and supplier net value) had positive impacts, while other variables had negative relationships. The initial evaluation of these results suggests that the influence of supplier characteristics and relationship attributes on supplier performance is

complex and multifaceted. This is consistent with the reports of Hunt and Davis (2008) and Morgan and Hunt (1999) who emphasised that relational resources can provide sustained competitive advantage, specifically because of the complexity and casual ambiguity involved in their development.

Despite this complexity, some patterns emerged. For example, the results showed that performance attributes that involve meeting physical requirements, such as quality of stock and timing were strongly affected by supplier characteristics, such as ability and motivation. The other performance attributes that were less physical in nature, such as communication and loyalty, were influenced more by the attributes of the relationship. In Model 4, these results will be evaluated with the inclusion of relationship quality as a mediator.

7.4.4 Structural Model 4: Indirect effects of relationship quality (with direct effects)

Model 4 (Figure 7-9) tested the effect of adding relationship quality as a mediator to Model 3. This aimed to analyse how the presence of relationship quality affected the direct relationships identified in the previous model, and also to identify the strength of the indirect (mediated) relationships. The path coefficients for the direct effects are not shown in Figure 7-9 for simplicity purposes but are presented in Table 7-14.

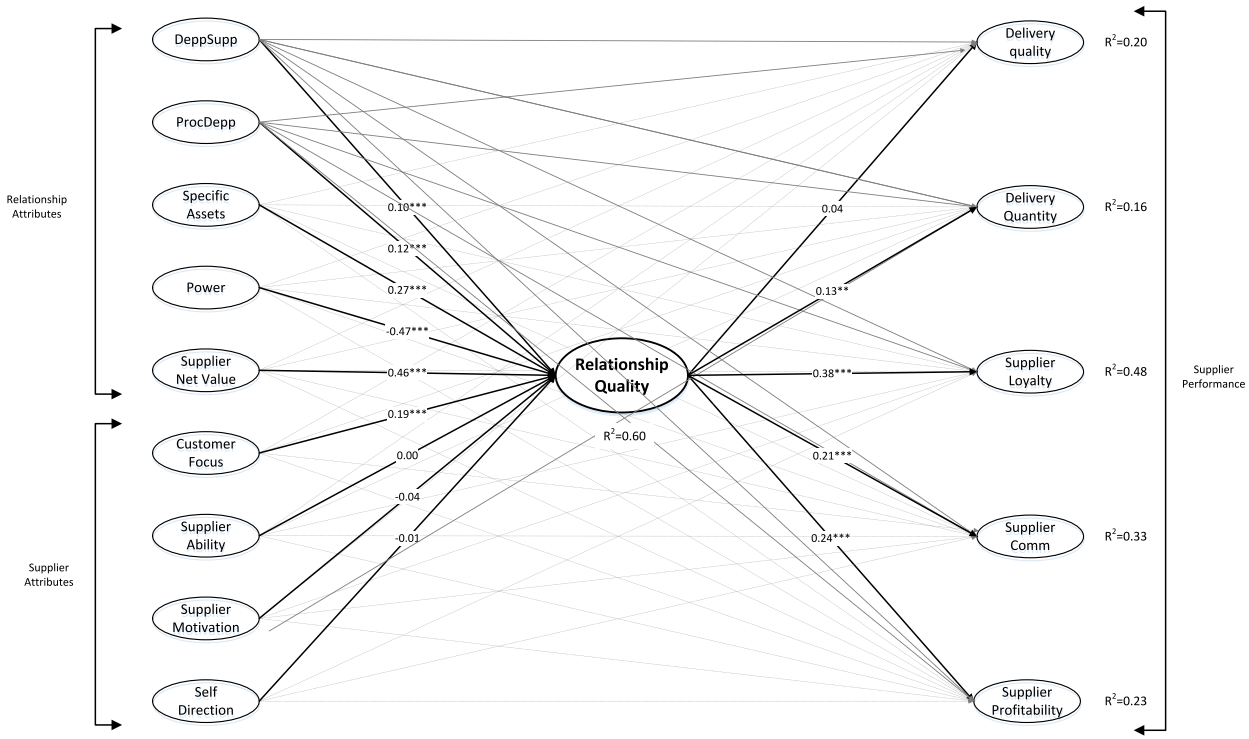

Figure 7-9: Model 4 - direct effects and indirect effects with mediation by relationship quality[32]

Model 2, with only indirect effects, had the least model fit and Model 4, with both direct and indirect effects, had the best fit. These results were likely to be partly because increasing the number of paths improves the model fit. Model 3, with only direct effects, also had acceptable model fit, although less than in Model 4.

Table 7-12: Model fit comparison for Model 1 and Model 2, Model 3 and Model 4

Measure	Structural model 1. Antecedents of RQ	Structural Model 2. Indirect effects	Structural Model 3. direct effects	Structural Model 4 direct and indirect effects	Threshold
Chi-square/df (cmin/df)	4.6	5.5	3.4	2.9	< 3 good
CFI	0.96	0.82	0.93	0.93	> 0.95 great; >0.9 traditional
GFI	0.98	0.91	0.96	0.95	> 0.95 good
AGFI	0.93	0.87	0.91	0.92	> 0.80
RMSEA	0.06	0.068	0.05	0.045	< 0.05 good; 0.05-0.10 moderate
PCLOSE	0.24	0.00	0.08	0.98	> 0.05

[32] The standardised regression weights are not shown for the direct paths in order to simplify the model. These are shown in (Table 7-14).

Table 7-13: Squared multiple correlations (R^2) for mediated model (indirect effects) and for the unmediated model (direct Effects)

Supplier performance variables	Estimate (R^2) Model 2 indirect effects	Estimate (R^2) Model 3 direct effects	Estimate (R^2) Model 4 direct and indirect effects
supplier communication	0.17	0.32	0.32
Supplier Profit	0.10	0.22	0.23
Loyalty	0.40	0.42	0.48
delivery quality	0.02	0.20	0.19
Delivery Quantity	0.04	0.16	0.15

Table 7-13 compares the R^2 values for each of the three models. Model 2 has the lowest R^2 values, which suggest that relationship quality on its own explained less variance than either the unmediated model or the model with direct and indirect effects combined. Model 4, which combined both the indirect effects and the direct effects, had the same, or higher, R^2 values for supplier communication, profitability and loyalty but slightly lower values for delivery quality and quantity. These results show that relationship quality plays a significant role in the first three variables but has little effect on the quality variables.

Table 7-14: Model 4 - standardised direct effects (with relationship quality as mediator) on supplier performance

	Relationship Attributes					Supplier Characteristics				
	Supplier net value	Supplier dependence	Processor dependence	Specific assets	Power	Supplier ability	Supplier motivation	Self-direction	Customer focus	Relationship quality
Relationship quality	0.46***	0.10***	0.12***	0.27***	-0.47***	0.00 (ns)	-0.04 (ns)	-0.01 (ns)	0.19***	
Supplier communication	0.13***	0.09**	0.02 (ns)	0.10*	0.04 (ns)	0.00 (ns)	0.27***	-0.01 (ns)	0.10**	0.21***
Supplier profit	0.13**	-0.18***	0.02 (ns)	-0.03 (ns)	0.02 (ns)	0.02 (ns)	-0.14***	0.17***	-0.05 (ns)	0.24***
Supplier loyalty	0.13***	0.16***	-0.05 (ns)	0.11**	-0.24***	0.03 (ns)	0.05 (ns)	0.09***	-0.04 (ns)	0.38***
Delivery quality	0.02(ns)	0.06 (ns)	-0.05 (ns)	0.03 (ns)	0.03 (ns)	0.11**	0.21***	-0.18***	0.09**	0.04
Delivery quantity	0.01 (ns)	0.03 (ns)	-0.03 (ns)	-0.02 (ns)	0.09 (ns)	0.11**	0.24***	-0.13***	-0.02 (ns)	0.13***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *. Values in shaded boxes represent values that have changed with mediation by relationship quality.

Overall, there was good explanatory power in all three models. Model 4 explained nearly a quarter of the variation in supplier profitability, almost half of the variation in supplier loyalty and a third of the variation in supplier communication. Delivery quality and quantity, had lower R^2 values although, at 16 and 20%, they still represented a significant amount of variation explained. Table 7-14 shows the direct effects of Model 3 with the introduction of relationship quality as a mediator. The indirect effects in Model 3 are shown in Table 7-15. Both of these included the indirect and direct effects together. Without the inclusion of

relationship quality, the direct effects include their influence on relationship quality. Where there was mediation by relationship quality then the value of the direct effect will decrease as the contribution of relationship quality was separated out. and Table 7-17 show that there was significant mediation by relationship quality between the supplier and relationship characteristics and supplier performance. The shaded boxes in Table 7-17 and Table 7-16 identify the variables where the effect has changed with the influence of relationship quality. These results showed that relationship quality played a role in nearly all of the associations between the relationship attributes, supplier characteristics and supplier performance. The only variables that had no mediation effect were:

1. Supplier ability with delivery quality and quantity.
2. Supplier motivation with delivery quantity, profitability.
3. Self-direction with supplier profitability and delivery quality.
4. Customer focus with communication and delivery quality.
5. Power and supplier loyalty.

Table 7-15: Model 3 - standardised indirect (mediated) effects on supplier performance

Variable	Relationship Attributes					Supplier Characteristics			
	Supplier net value	Supplier dependence	Processor dependence	Specific assets	Power	Supplier ability	Supplier motivation	Self-direct	Customer focus
Supplier communication	0.10***	0.02***	0.03***	0.06***	-0.10***	0.00 (ns)	-0.01 (ns)	0.00 (ns)	0.04***
Supplier profit	0.11***	0.02***	0.03***	0.07***	-0.11***	0.00 (ns)	-0.01 (ns)	0.00 (ns)	0.05***
Supplier loyalty	0.18***	0.04***	0.05***	0.11***	-0.18***	0.00 (ns)	-0.02 (ns)	-0.01 (ns)	0.07***
Delivery quality	0.02 (ns)	0.00 (ns)	0.01 (ns)	0.01 (ns)	-0.02 (ns)	0.00 (ns)	0.00 (ns)	0.00 (ns)	0.01 (ns)
Delivery quantity	0.06**	0.01**	0.02**	0.04**	-0.06**	0.00 (ns)	0.01 (ns)	0.00 (ns)	0.02**

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

7.4.5 Influence of supplier characteristics on performance

This section shows the impact of mediation on the effects of supplier characteristics on supplier performance. This is shown in Table 7-16, firstly, by presenting the size of the direct effect without mediation and, secondly, by showing how this direct effect changes with mediation by relationship quality. It also shows the indirect effect that occurs through relationship quality when no direct effects exist.

Table 7-16 Supplier characteristics and performance variables (with and without mediation)

Variables			Mediation Effects			
Independent Variable	**Mediating Variable**	**Dependent Variable**	**Direct Effect (no mediator)**	**Direct Effect (with mediator)**	**Indirect**	**Result**
SelfDirect	RQ	DeliveryQuantity	-0.13***	-0.13***	0.00	No mediation
SelfDirect	RQ	DeliveryQuality	-0.18***	-0.18***	0.00	No mediation
SelfDirect	RQ	SupplierLoyalty	0.08***	0.09***	-0.01	No mediation
SelfDirect	RQ	SupplierComm	-0.01	-0.01	0.00	No effect
SelfDirect	RQ	SupplierProfit	0.17***	0.17***	0.00	No mediation
CustomerFocus	RQ	DeliveryQuantity	0.00	-0.02	-0.02**	Indirect effect
CustomerFocus	RQ	DeliveryQuality	0.09*	0.09**	0.00**	No mediation
CustomerFocus	RQ	SupplierLoyalty	0.03	-0.04	-0.07***	Indirect effect
CustomerFocus	RQ	SupplierComm	0.15***	0.10**	0.05***	Partial mediation
CustomerFocus	RQ	SupplierProfit	0.00	-0.05	0.05***	Indirect effect
SuppMotivation	RQ	DeliveryQuality	0.21***	0.21***	0.00	No mediation
SuppMotivation	RQ	DeliveryQuantity	0.24***	0.24***	0.00	No Mediation
SuppMotivation	RQ	SupplierLoyalty	0.03	0.05	-0.02	No effect
SuppMotivation	RQ	SupplierComm	0.26***	0.27***	-0.01	No mediation
SuppMotivation	RQ	SupplierProfit	-0.15***	-0.15***	0.00	No mediation
SupplierAbility	RQ	DeliveryQuality	0.11***	0.11**	0.00	No mediation
SupplierAbility	RQ	DeliveryQuantity	0.11***	0.11**	0.00	No mediation
SupplierAbility	RQ	SupplierLoyalty	0.03	0.03	0.00	No effect
SupplierAbility	RQ	SupplierComm	0.00	0.00	0.00	No effect
SupplierAbility	RQ	SupplierProfit	0.02	0.02	0.00	No effect

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *. The shaded boxes identify the relationships that have either partial mediation or indirect effects.

The supplier characteristics had only one relationship that resulted in partial mediation. This occurs in the relationship between customer focus and supplier communication. Partial mediation occurred because the direct effect decreased in value and significance with the inclusion of relationship quality, but there was still a significant direct effect. Relationship quality was, therefore, a necessary prerequisite for a portion of the effect of customer focus on supplier communication. There were no mediated effects between customer focus and delivery quality; however, indirect effects occurred between customer focus and the remaining supplier performance variables. This outcome means that for these variables there was no direct effect but a significant relationship occurred indirectly through the mediator. As a result, the effect on these specific supplier performance variables only occurred through relationship quality.

The rest of the supplier characteristics had no mediation effects. Some variables had no effect. These were supplier ability on loyalty, communication, profitability and self-direction on communication as well as supplier motivation on communication. These results show that relationship quality play only a minor role in the effects of supplier characteristics on supplier performance however there were significant direct effects.

7.4.6 Influence of relationship attributes on performance

The relationship attribute variables were more complex and diverse in their effects on supplier performance. This was because relationship quality played a significant mediating role in the interactions between the relationship attributes and supplier performance. This was somewhat different from the supplier characteristics variables where the primary influence on supplier performance occurred directly without mediation.

Table 7-17: Effects of relationship characteristics of supplier performance variables (with and without mediation)

Variables			**Mediation Effects**			
Independent Variable	Mediating Variable	Dependent Variable	Direct Effect (no mediator)	Direct Effect (with mediator)	Indirect	Result
ProcDependence	RQ	DeliveryQuality	-0.04	0.04	0.01	No effect
ProcDependence	RQ	DeliveryQuantity	-0.02	0.03	0.02**	Indirect effect
ProcDependence	RQ	SupplierLoyalty	-0.01	-0.01	0.05***	Indirect effect
ProcDependence	RQ	SupplierComm	0.05	0.02	0.03***	Indirect effect
ProcDependence	RQ	SupplierProfit	0.05	0.02	0.03***	Indirect effect
SuppDependence	RQ	DeliveryQuality	0.06	0.06	0.004	No effect
SuppDependence	RQ	DeliveryQuantity	0.04	0.03	0.01**	Indirect effect
SuppDependence	RQ	SupplierLoyalty	0.20***	0.16***	0.04***	Partial mediation
SuppDependence	RQ	SupplierComm	0.11**	0.09***	0.02***	Partial mediation
SuppDependence	RQ	SupplierProfit	-0.16***	- 0.18***	0.02***	Partial mediation
SpecificInvest	RQ	DeliveryQuality	0.04	0.03	0.01	No effect
SpecificInvest	RQ	DeliveryQuantity	0.02	-0.02	0.04**	Indirect effect
SpecificInvest	RQ	SupplierLoyalty	0.22***	0.11***	0.11***	Partial mediation
SpecificInvest	RQ	SupplierComm	0.16***	0.10***	0.06***	Partial mediation
SpecificInvest	RQ	SupplierProfit	-0.03	0.03	0.07***	Indirect effect
Power	RQ	DeliveryQuality	0.01	0.03	-0.02	No effect
Power	RQ	DeliveryQuantity	0.03	0.09	-0.06***	Indirect effect
Power	RQ	SupplierLoyalty	-0.42***	-0.24***	-0.18***	Partial mediation
Power	RQ	SupplierComm	0.06	0.04	-0.10***	Indirect effect
Power	RQ	SupplierProfit	-0.10*	0.02	-0.11***	Full mediation
SupplierNetValue	RQ	DeliveryQuantity	0.04	0.02	0.06***	Indirect effect
SupplierNetValue	RQ	DeliveryQuality	0.07	0.01	0.02	No effect
SupplierNetValue	RQ	SupplierLoyalty	0.31***	0.13***	0.18***	Partial mediation
SupplierNetValue	RQ	SupplierComm	0.23***	0.13***	0.10***	Partial mediation
SupplierNetValue	RQ	SupplierProfit	0.24***	0.13***	0.11***	Partial mediation

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *. The shaded boxes identify the relationships that have either partial mediation, indirect effects or full mediation.

The addition of relationship quality as a mediator created a number of effects on the interactions between supplier characteristics and supplier performance. Firstly, power had a fully mediated effect in the relationship between power and supplier profitability. This means the effect of power on supplier profitability only occurred through relationship quality. Secondly, partial mediation occurred between some of the relationship attributes and supplier performance variables. For example, supplier dependence and supplier net value had partially mediated effects on supplier loyalty, communication and profitability.

There was also partial mediation between specific assets and supplier loyalty and communication. Furthermore, the relationship between power and supplier loyalty was partially mediated by relationship quality. For these relationships, there are both a direct effect on supplier performance as well as an indirect effect mediated by relationship quality.

The remainder of the variables had only indirect effects through relationship quality or had no effect on supplier performance. Processor dependence had most indirect effects, with indirect relationships with supplier loyalty, communication and profitability. Other indirect effects were between specific investments and supplier profitability, as well as a negative indirect effect between power and supplier communication.

Finally, none of the relationship attributes had any effect on delivery quality. This result signified that the relationship variables had no impact on the quality of stock delivered. It can be concluded that relationship quality does not play a major mediating role between the supplier characteristics variables and performance. In contrast, relationship quality was an important mediating variable for nearly all the relationship attribute variables. Customer focus was the only exception for supplier characteristics; and delivery quality was the only exception for relationship attributes. The next section takes the results from the direct and mediated effects and combines them in a re-specified model.

7.4.7 Model 5: Re-specified model

Model 5 is the re-specified model. A full outline of the respecified model is presented in Appendix F. This is based on the results of model 3 by including only the statistically significant direct and mediated effects. Therefore, this model incorporated the direct, mediated and indirect paths that were still statistically significant ($p<0.01$). Due to the complexity of the relationships in the re-specified model each of these relationships are explained separately in the next section. Firstly, the effect of each independent variable on the supplier performance variables is described, as shown in Figure 8-1. Secondly, the antecedents of each supplier performance are presented (Figure 9-1)

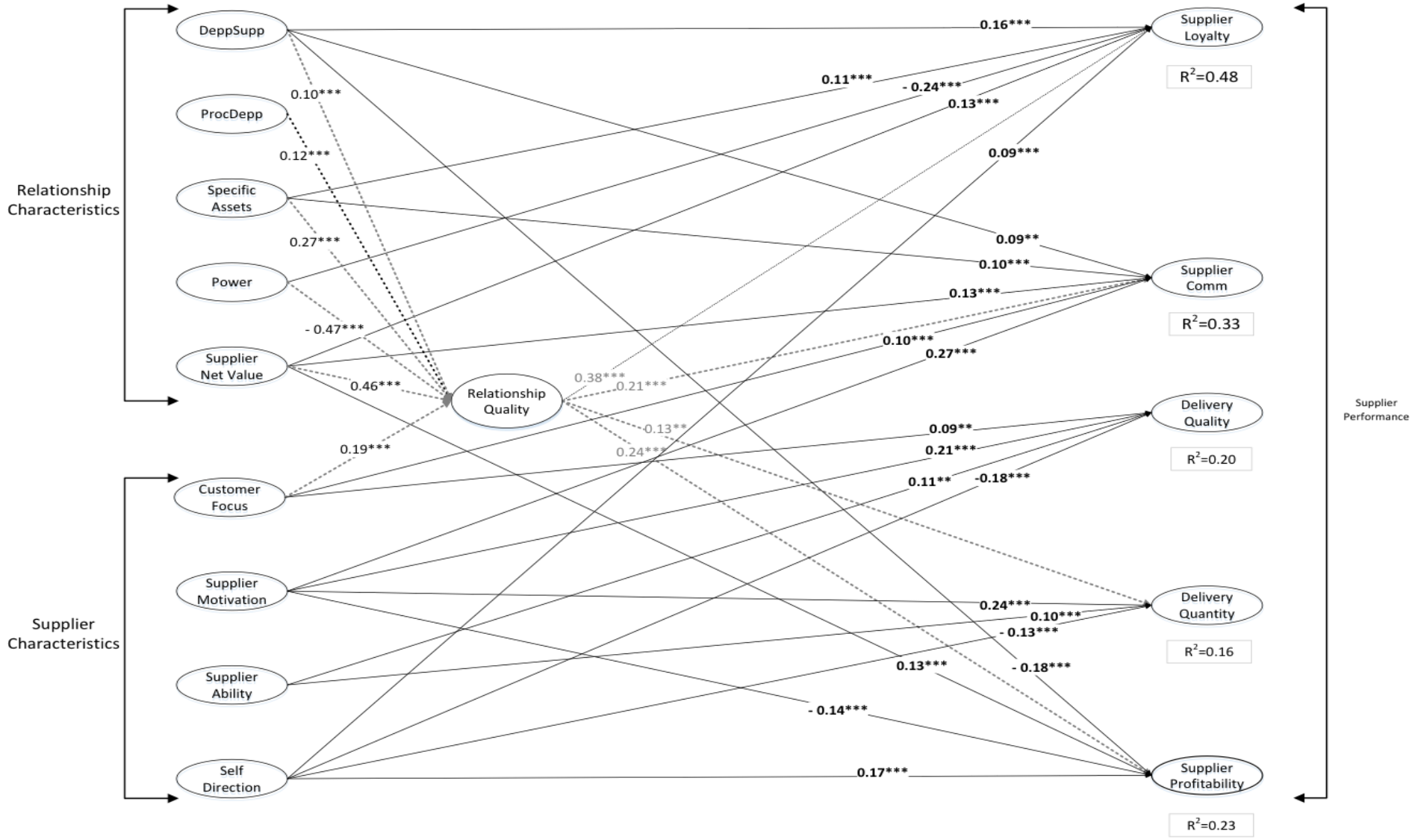

Figure 7-10: Model 5 - respecified model

Chapter 8: Results – supplier characteristics and relationship attributes

8.1 Re-specified model: Effects of supplier characteristics on supplier performance

This section describes how each of the supplier and relationship variables influence relationship quality and supplier performance (Table 8-1). This, in effect, shows the impact of only one independent variable on relationship quality and all of the dependent supplier performance variables (Figure 8-1). As the model still incorporates the other independent variables then these act like control variables, enabling the unique effect of each supplier or relationship variable to be evaluated in isolation. This enables the specific relationships within the respecified model (Figure 7-10) to be explained in detail.

Table 8-1: Summary of direct and indirect effects on supplier performance

Supplier characteristics	Delivery quality	Delivery quantity	Loyalty	Communication	Profitability
Self-direction	Direct (-0.18***)	Direct (-0.13***)	Direct (0.09***)		Direct (0.17***)
Customer focus	Direct (0.09***)	Indirect (0.02**)	Indirect (0.07***)	Direct (0.0.10***) Indirect (0.04***)	Indirect (0.05***)
Supplier motivation	Direct (0.21***)	Direct (0.24***)		Direct (0.27***)	Direct (-0.15)
Supplier ability	Direct (0.11***)	Direct (0.11**)			
Relationship attributes					
Supplier net value		Indirect (0.06***)	Direct (0.13***) Indirect (0.18***)	Direct (0.13***) Indirect (0.10***)	Direct (0.13***) Indirect (0.11***)
Processor dependence		Indirect (0.02***)	Indirect (0.05***)	Indirect (0.03***)	Indirect (0.03***)
Supplier dependence		Indirect (0.04***)	Direct (0.16***) Indirect (0.11***)	Direct (0.09**) Indirect (0.02***)	Direct (-0.18***) Indirect (0.02***)
Specific assets		Indirect (0.04***)	Direct (0.11***) Indirect (0.11***)	Direct (0.10***) Indirect (0.06***)	Indirect (0.07***)
Power		Indirect (0.06***)	Direct (-0.24***) Indirect (-0.18***)	Indirect (-0.10***)	Indirect (-0.11)

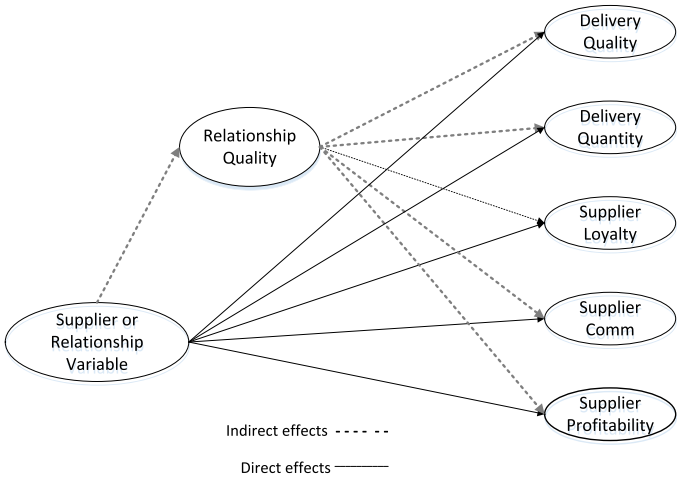

Figure 8-1: Model of effect of individual supplier and relationship variables on supplier performance

8.1.1 Self-direction

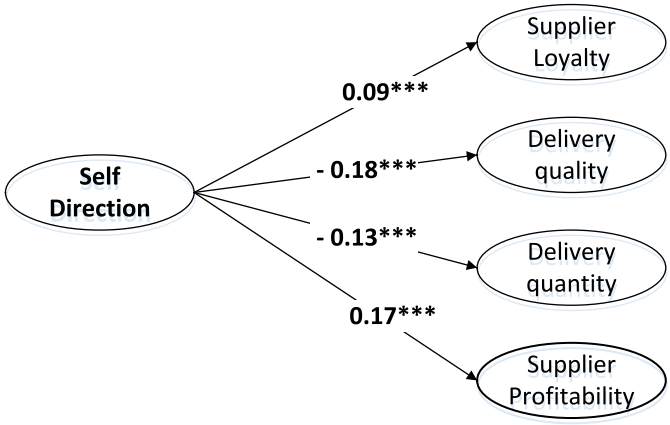

Figure 8-2: Effects of self-direction on supplier performance

Self-direction affected four of the five supplier performance variables, with no effect from relationship quality (Figure 8-2). The absence of mediation indicates that for self-directed suppliers increasing relationship quality does not affect performance.

The effects of self-direction on supplier performance suggests that these suppliers made independent decisions on the type of relationship they wished to have with the processor. They did not seek to build stronger relationships with processors. They focused on the goals and objectives they wished to achieve. The result was that their loyalty and delivery quality and timing were decided based on their own criteria and not on what the processor required. The effect of this was to improve the profitability of these suppliers.

8.1.2 Customer focus

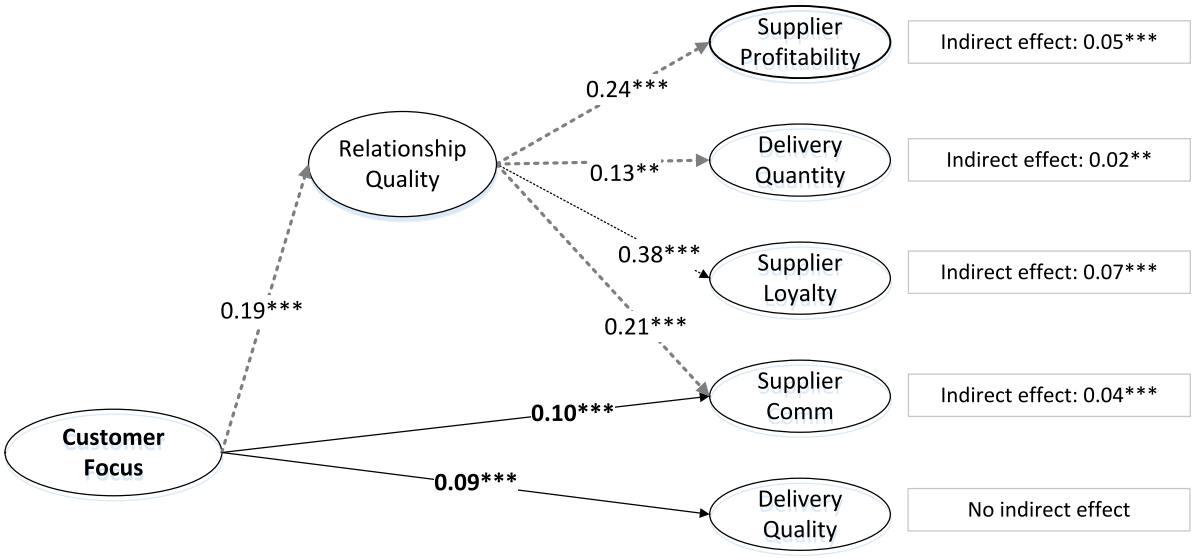

Figure 8-3: Effects of customer focus on supplier performance

In contrast to self-direction customer focus has a complex interaction with supplier performance as it has both indirect (mediated) and direct (unmediated) effects on the supplier performance variables. It was also an important supplier characteristic as it was the only one of these variables that was mediated by relationship quality. As well as this, customer focus was the only variable that affected all five of the supplier performance variables (Figure 8-3).

Without relationship quality, suppliers who were customer-focused will have lower outcomes in terms of supplier performance. This was especially important for supplier profitability, delivery quantity and supplier loyalty, as without mediation by relationship quality customer focus had no effect on these suppliers' performance variables. It was, therefore, necessary for processors to build strong relationships with these suppliers to realise the full effect on the suppliers' performance outcomes. This makes selecting suppliers with a customer-focus and developing strong relationships with them, an important priority for buyers who wanted to improve supplier performance.

8.1.3 Supplier motivation

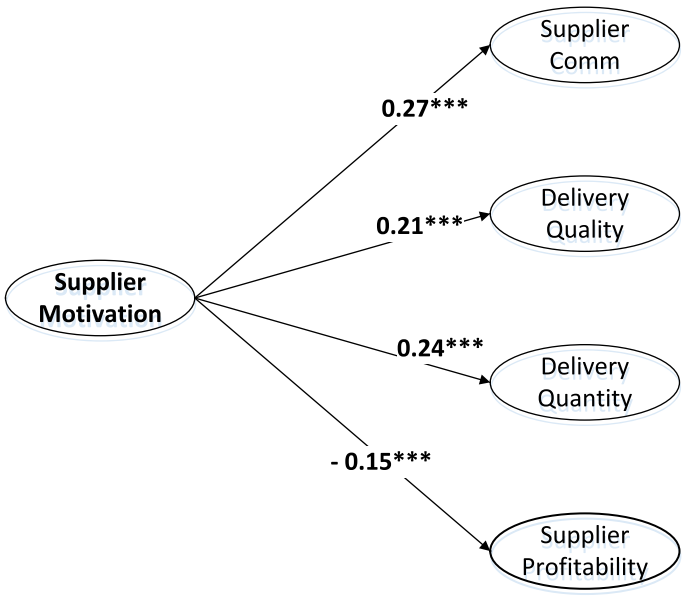

Figure 8-4: Effects of supplier motivation on supplier performance.

Supplier motivation had significant positive effects on several supplier performance variables. These were all direct effects with no effect of relationship quality. There were positive effects on communication, delivery quality and quantity but an adverse effect on profitability (Figure 8-4).

Supplier motivation was an important antecedent from a processor's perspective. It was the only variable that affected both the quality variables as well as communication. It appeared that these suppliers aimed to meet the processors' quality and communication requirements even at the detriment to their own profitability. This would indicate that these suppliers had other objectives than purely financial. The main issue is that these suppliers are likely to be less loyal and are not influenced by improving relationship quality.

8.1.4 Supplier ability

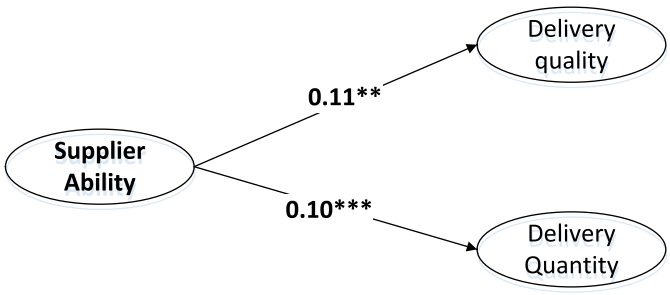

Figure 8-5: Effects of supplier ability on supplier performance

Supplier ability is an important supplier characteristic as it directly affects the two quality variables. These involve meeting the processor's requirements for timely delivery of the right numbers of quality stock. However, there was no significant effect on any of the other supplier performance variables, nor was there any mediation by relationship quality. Farm management ability is, therefore, an important supplier selection criteria for processors who want suppliers who can meet their higher quality and delivery timing specifications. However, these suppliers may not be loyal or communicate to the processor nor are they more profitable than other suppliers.

8.2 Effect of relationship attributes on supplier performance

This section identifies the direct and indirect effects of the relationship attributes on the supplier performance variables.

8.2.1 Supplier net value

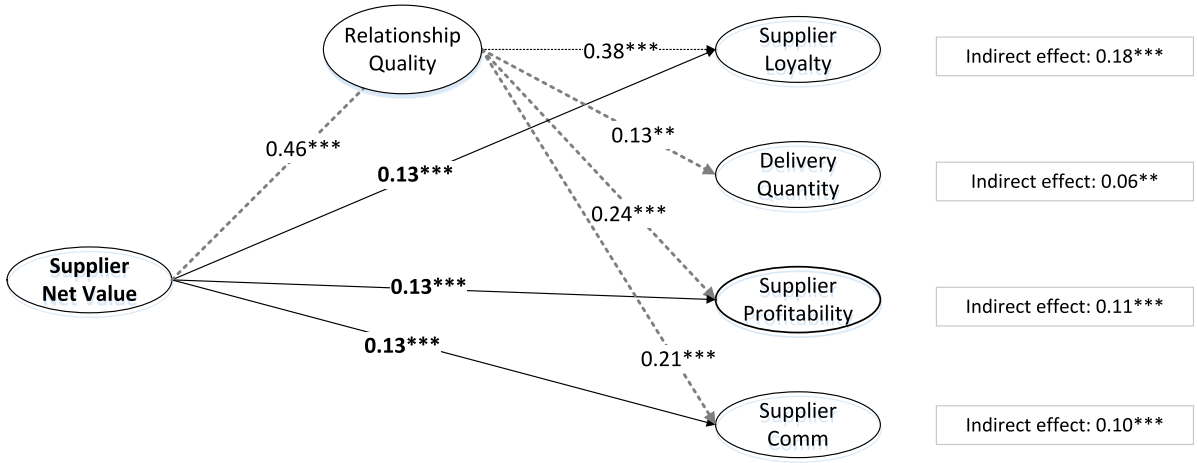

Figure 8-6: Effects of supplier net value on supplier performance

Supplier net value emerged as one of the most important variables to affect supplier performance. This was a result of both direct effects and mediation by relationship quality. It had effects on four of the supplier performance variables. Delivery quality was the only variable not affected by supplier net value.

Delivery quantity was only affected through mediation by relationship quality. This result implies that these suppliers will only deliver the numbers of stock when required by the processor if they have a good relationship with their buyer. Relationship quality also explained a significant portion of the effect of supplier net value on supplier loyalty, communication and profitability. These relationships also had direct effects. These results indicate that supplier net value is an important variable that affects supplier's loyalty, willingness to share information and their profitability. Furthermore, these affects are strengthened when supplier have a closer relationship with their buyer.

The relationship between supplier net value and profitability is important as this showed that relationship quality was necessary for suppliers to fully realise benefits in terms of farm profit derived from a positive net value. Net value includes access to new technologies and access to premium markets, as well as other strategic benefits. It was clear that realising the full advantage of these required a close relationship with the processor.

In summary, supplier net value is an important variable to increase supplier performance. It has positive direct and indirect effects on all supplier performance variables other than delivery quality. Furthermore, relationship quality plays an important role in the effects of all these relationships. Therefore, it was required to maximise the supplier performance outcomes from this variable.

8.2.2 Processor dependence

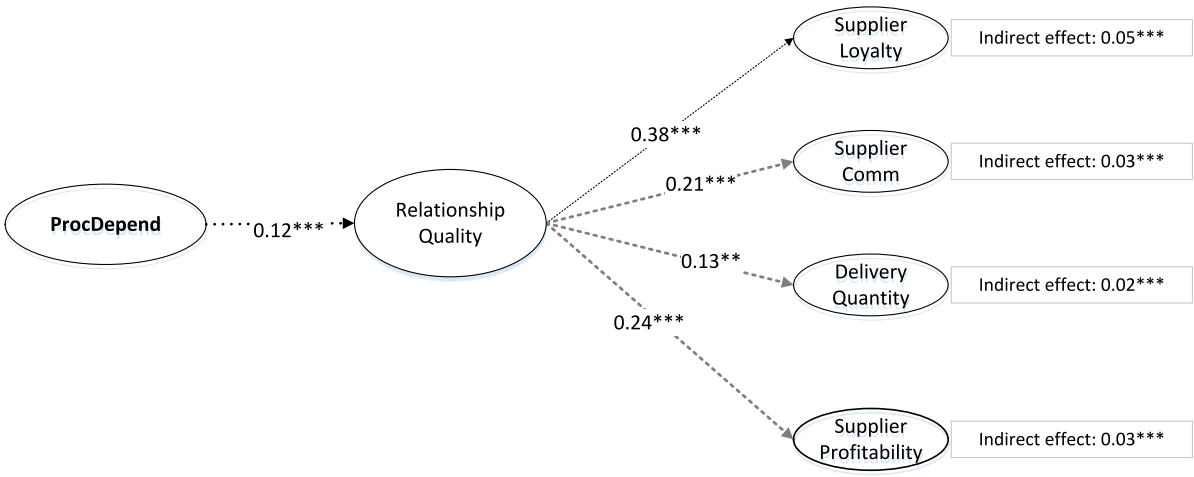

Figure 8-7: Effects of processor dependence on supplier performance

The effect of processor dependence on supplier performance was only through indirect effects mediated by relationship quality.

Although the indirect effects were small, they showed that when the processor was dependent on their suppliers, the effects on performance only occurred if there was a high-quality relationship between the two parties. Processors who were dependent on their suppliers were more likely to work harder at maintaining their relationship with these suppliers. This increased relationship quality and had a flow on effect on supplier performance.

Although there were no direct effects, there were however, some significant correlations with other supplier and relationship characteristics. A number of these arose from the fact that the processor was likely to be more dependent on suppliers with characteristics that led to improved supplier performance. They are likely to be less able to substitute these suppliers, thereby increasing processor dependence. This was confirmed by the correlations between processor dependence and specific investments (0.35***) supplier motivation (0.14***) and customer focus (0.17***) – see Table 9-1. In summary, without relationship quality, processor dependence had no effect on supplier performance. With the inclusion of

relationship quality, there were small but significant indirect effects. Processor dependence may have occurred because suppliers become less substitutable and, therefore, the processor was more likely to work to improve their relationship with theses suppliers; this resulted in improvements in supplier performance.

8.2.3 Supplier dependence

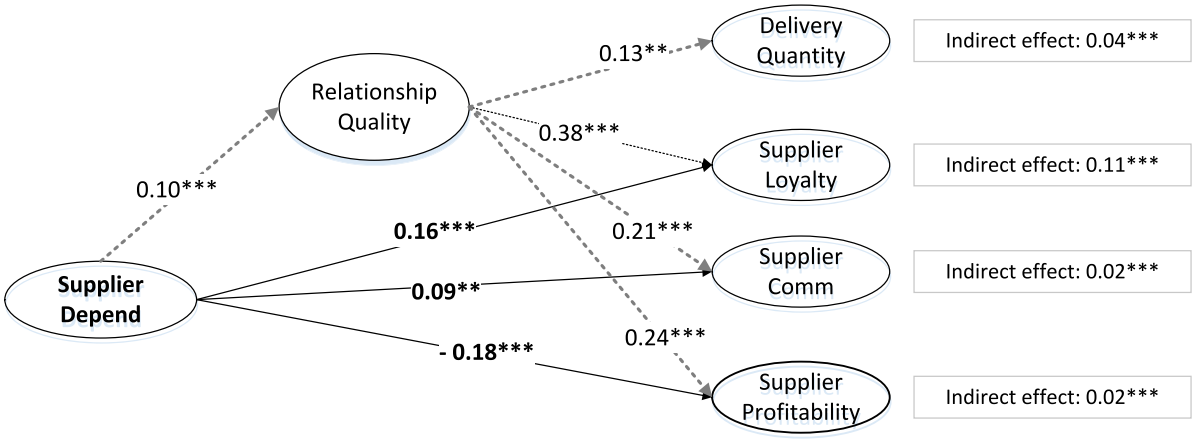

Figure 8-8: Effects of supplier dependence on supplier performance

Supplier dependence was an important antecedent to supplier performance with both direct and indirect effects on these variables. Relationship quality partly mediated three of these effects including supplier profitability, communication and loyalty (Figure 8-8). The results showed that dependent suppliers were more likely to be loyal and share information with their buyer. These strong direct effects may reflect the fact that these suppliers feel obligated to communicate and remain loyal. This may be because they were locked into supplying their buyer due to a dependent relationship. Though the mediated effect on communication was small, it does indicate that with greater trust and commitment it is more likely that these suppliers will share even more information with buyers. This suggests that for effective communication there needed to be more than coercive incentives to communicate and there also needed to be a willingness based on trust, commitment and social capital.

The effect of relationship quality on supplier profitability, although small, was significant in that although the indirect (mediated) effect was positive (0.02***), the direct effect was negative (-0.18***). This effect suggests that relationship quality mitigated some of the negative effects of supplier dependence. Without a good relationship between the

processor and supplier dependence was detrimental to supplier profitability. These effects may indicate that dependent suppliers sought an improved relationship with their processor to reduce the potential for opportunistic behaviour. Dependent suppliers are likely to have fewer options and have higher switching costs, as a result they may tend to be more bound to their processor. Dependent suppliers are likely to feel more vulnerable in their relationship with their processor. As a result, they may accept a less favourable price for their products or agree to produce to higher specifications without sufficient compensation. This impact may explain the negative effect on the supplier's profitability. This result was also confirmed by the correlation between supplier dependence and power (0.28***). Processors are more likely to exercise coercive power on dependent suppliers rather than providing incentives and rewards.

In summary, supplier dependence is an important antecedent to supplier performance with mostly positive effects on supplier performance. The exception was supplier profitability which had a direct negative effect and a positive indirect effect. Supplier dependence suggests that these suppliers may have high switching costs. Hence, supplier dependence can decrease supplier profitability as well as increase communication and loyalty. Relationship quality was important for supplier profitability as it mitigated some of the negative effects of dependence. Therefore, supplier dependence without relationship quality was likely to result in an obligation-based supplier performance.

8.2.4 Specific assets

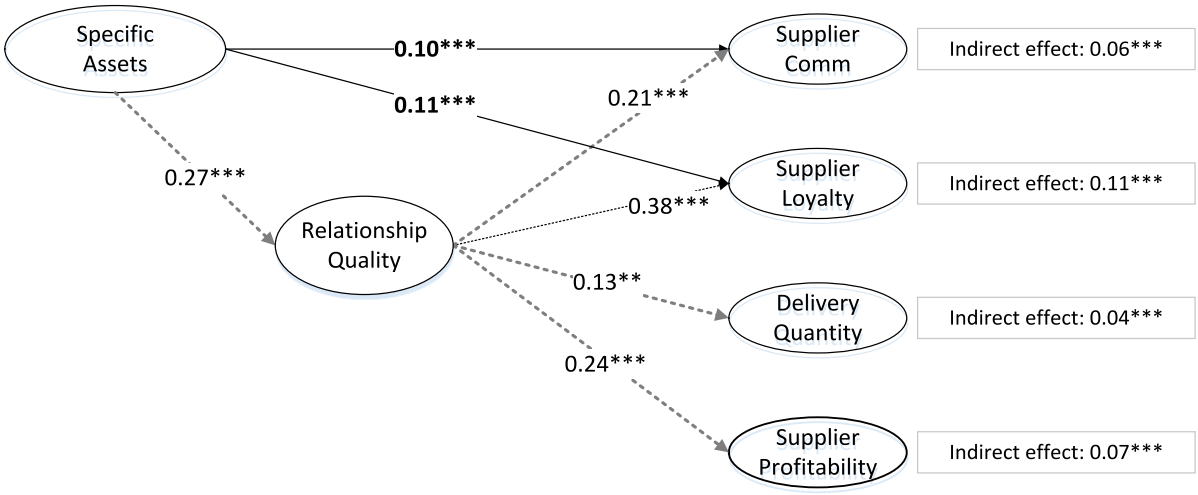

Figure 8-9: Effects of specific investments on supplier performance

Specific assets had positive direct effects on supplier loyalty and communication (Figure 8-9), as well as positive indirect effects on all the supplier performance variables, other than delivery quality. This shows the importance of specific assets in improving supplier performance. The dilemma for suppliers is that specific assets by definition have less value with alternative processors. Therefore, these investments create greater dependence on the processor and increase the risk of opportunistic behaviour. This was confirmed by the high correlation between specific investments and supplier dependence (0.47***) and power (0.68***) (Table 9-1). At the same time investments in specific assets increase the supplier's profitability either through increased efficiency or improving the quality of output. Specific investments were also correlated with several supplier characteristics, including customer focus (0.36**), supplier motivation, (0.19***) and supplier ability (0.13***). Suppliers with these characteristics are more likely to invest in specific assets that will enable them to better meet the processors' specifications.

A small, indirect relationship existed between specific assets and delivery quantity (0.04***) and supplier profitability (0.07***). This indirect relationship to supplier profitability implied that specific assets, by themselves, did not improve supplier profitability. It was only when a positive relationship with the buyer existed that these specific investments had a positive effect on supplier profitability. These relationships are in line with the literature on specific assets. This literature states that specific assets increase the risk of opportunistic behaviour by the buyer and that dimensions of relationship quality, such as trust, can act as governance mechanisms to mitigate opportunistic behaviour (Ba & Pavlou, 2002; Cavusgil, Deligonul, & Zhang, 2004; Nooteboom, 1996). Finally, there was a small indirect relationship with delivery quantity. This effect means that specific assets only result in suppliers delivering the required quantity of stock if there is a high level of relationship quality between the supplier and the buyer.

In summary, specific assets had a substantial, direct effects on both supplier loyalty and communication. Furthermore, relationship quality played an important role in mitigating the effects of suppliers' investments in specific assets. The mediating effect of relationship quality enhanced the effect of specific investments on loyalty and communication. Relationship quality was also a prerequisite for specific assets to affect supplier's willingness to meet delivery timing specifications and to increase profitability.

8.2.5 Power

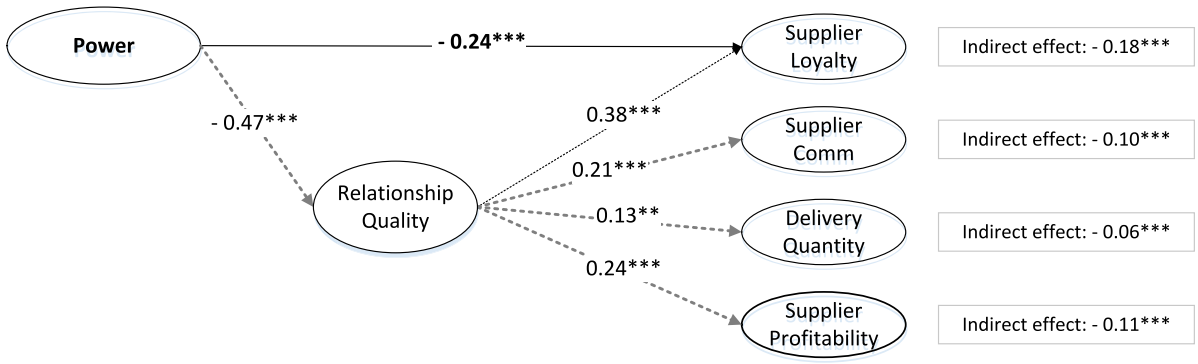

Figure 8-10: Effects of power on supplier performance

Coercive power had a negative impact on all the supplier performance variables. The only exception was that power has no effect on delivery quality. Nearly all the effects of power were mediated by relationship quality. The only direct effect existed between power and supplier loyalty (-0.24***). This effect on loyalty was also mediated by relationship quality, which had a significant negative effect (-0.18**). These two effects combined to illustrate the strong negative impact the use of power has on supplier loyalty (-0.42***)[33]. The processor's use of power had a negative impact on relationship quality, and this reduced the positive effect that relationship quality had on supplier performance.

The remainder of the relationships were indirect effects mediated by relationship quality. There was full mediation between the processors' use of power and supplier profitability. This means that power only affects supplier profitability through the effect on relationship quality. Power also had an indirect negative effect on delivery quantity and supplier communication. Therefore, the use of coercive power by the buyer negatively affected relationship quality which reduced the positive effect of relationship quality on delivery quantity and communication. This is consistent with the findings of Brown et al. (1995) who identified that the use of coercive power has a negative effect on relationship quality and, in particular, on the levels of commitment.

In summary, a processor's use of power had an entirely negative impact on supplier performance. Nearly all these impacts were a result of the negative impact power had on relationship quality (-0.47***). Therefore, processors who wish to improve supplier

[33] Combined direct and indirect effect

performance need to avoid the use of power even though specific assets and supplier dependence may provide the opportunity. The largest impact of this was on supplier loyalty, communication and supplier profitability.

8.2.6 Summary of effects of supplier and relationship variables on supplier performance.

Supplier characteristics and relationship attributes play a significant role as antecedents to supplier performance. Furthermore, relationship quality has an important mediating effect on these relationships. The role of relationship quality was more significant with the relationship variables. All the supplier characteristics, other than customer focus, had no significant effect on relationship quality and therefore no mediating effect on supplier performance. This outcome suggests that relationship quality does not play a major role in the interaction between supplier characteristics and performance. Supplier characteristics had both positive and negative direct effects on supplier performance. Customer focus and supplier ability were the only variables that had solely positive effects on the supplier performance. The other supplier characteristics had at least one negative effect on supplier performance. This result shows that improving supplier performance by focusing on supplier characteristics is complex. It requires an understanding of the specific relationships between the aspects of supplier performance and the effect that these individual supplier characteristics have on supplier performance. For example, supplier motivation was an important characteristic for meeting quality specifications. However, these suppliers are less likely to be loyal to the processor nor are they more likely to be more profitable than other suppliers.

The interaction between relationship attributes and supplier performance were varied and complex. In contrast to the supplier characteristics, relationship quality had a significant mediating effect with the relationship attributes. These variables also had direct effects independent of relationship quality. An important result was that relationship quality played a role in reducing the negative effects of power and supplier dependence. Supplier dependence had a direct negative effect on supplier profitability however this changed to a positive effect when mediated by relationship quality. The results also highlighted the strong negative impact of coercive power on relationship quality and supplier performance with negative impacts on all the supplier performance variables.

Though these relationships tended to be complex and varied, they are in line with the findings of Morgan and Hunt (1994) who comment that it is this complexity and causal ambiguity which enable buyers to develop a sustained competitive advantage. This is also supported by Palmatier, Dant, Grewal, and Evans (2006) who found that relationship management strategies and exchange outcomes were more complex than suggested by current research. They also found support for the fundamental premise that relationship management and strong relationships positively affect performance.

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Chapter 9: Results - antecedents of supplier performance

The previous results section identified the interactions between the each of the supplier characteristics, relationship attributes and all supplier performance variables. This section presents these from a different perspective. The results in this section present the supplier characteristics and relationship attributes loaded onto each performance variable (Figure 9-1). This focus enables a picture of the antecedents for each of the supplier performance variables to be identified. While these relationships have been covered to some degree in the previous section, this analysis allows a clearer picture of the antecedents of each of the supplier performance variables. This view of the results has both theoretical and practical applications. It contains information on the antecedents of supplier performance that can provide processors with guidance on how to improve specific supplier performance variables.

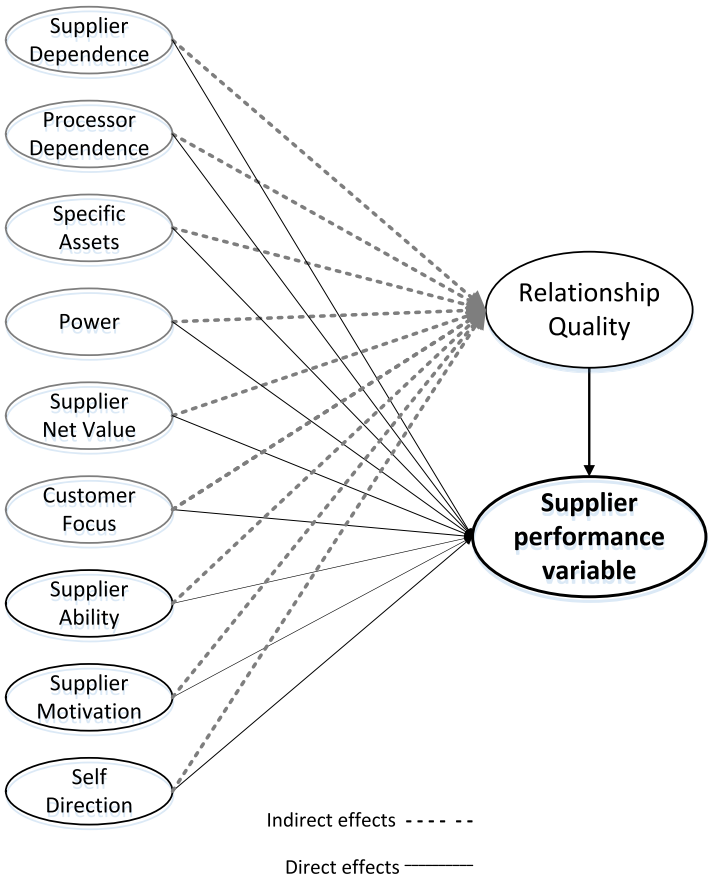

Figure 9-1: Model of antecedence of individual supplier performance variables

9.1.1 Delivery quality

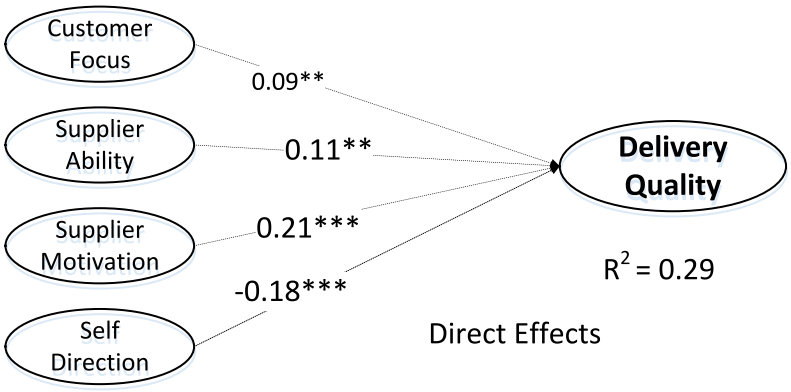

Figure 9-2: Antecedents of delivery quality

Having suppliers who deliver to the required quality specifications is an important objective for the buyer. Achieving this requires suppliers to grow their animals to the specified weight and age, undertake the correct management of animal health and welfare practices, as well as providing traceability. Delivery quality was only affected by supplier characteristics with no influence from relationship quality. Figure 9-2 shows that to improve quality requires having suppliers who are motivated and customer focused with good farm management skills. They also needed to be low on self-direction. These antecedents explain almost a third (29%) of the variation in delivery quality. It is therefore important for processors to select suppliers who have these characteristics, as developing these among suppliers was likely to be costly and difficult to achieve.

9.1.2 Delivery quantity

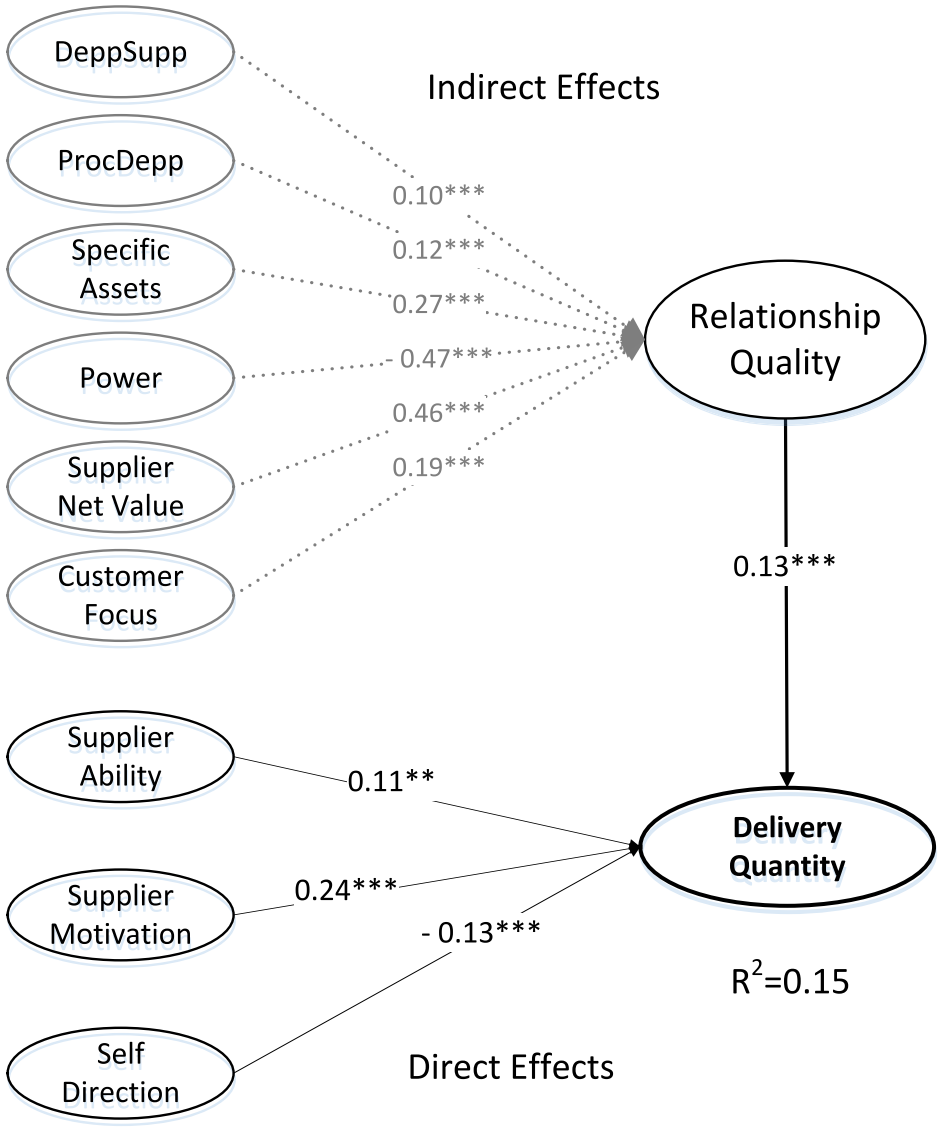

Figure 9-3: Antecedents of delivery quantity

Delivery quantity involves supplying the required number of stock at the time the processor needed them. As already discussed, this can be difficult for suppliers in a pasture-based production system. This requirement directly affects the suppliers' management as animal numbers are used to manage pasture growth. Delivery quantity, therefore, had a much more complex range of antecedents (Figure 9-3). These variables accounted for 15% of the variation in delivery quantity. This relatively low value implies that there are other variables not included that had a significant effect on delivery quantity. The obvious difference between delivery quality and quantity is the influence of relationship quality and the relationship attributes.

Similar to delivery quality, supplier characteristics, such as supplier ability, supplier motivation and self-direction, were important antecedents with only direct effects on delivery quantity (Table 7-15). All the remaining variables were mediated by relationship quality, including the supplier characteristic of customer focus. Although these indirect effects were significant they were relatively small in comparison to the direct effects. This was a result of the lower effect of relationship quality on supplier performance. These results show that if buyers want suppliers who deliver the right number of animals when required they needed motivated suppliers with superior farm management ability and they also needed to build high levels of relationship quality. As delivery timing had a greater impact on the suppliers' management flexibility, it was not surprising the relationship quality played some role. Suppliers will want to know that they can trust their processor and know that they will be rewarded for the extra cost and management effort involved in delivering stock when the processors required them. All the relationship characteristics had an influence on delivery quality because of the mediating effect of relationship quality.

In summary, to achieve the required delivery quantity processors need to select suppliers with superior farm management ability, high motivation and low self-direction. Furthermore, this effect can be increased by developing closer relationships with these suppliers. With closer relationships, delivery quantity is affected by all the relationship attributes as well as customer focus.

9.1.3 Supplier loyalty

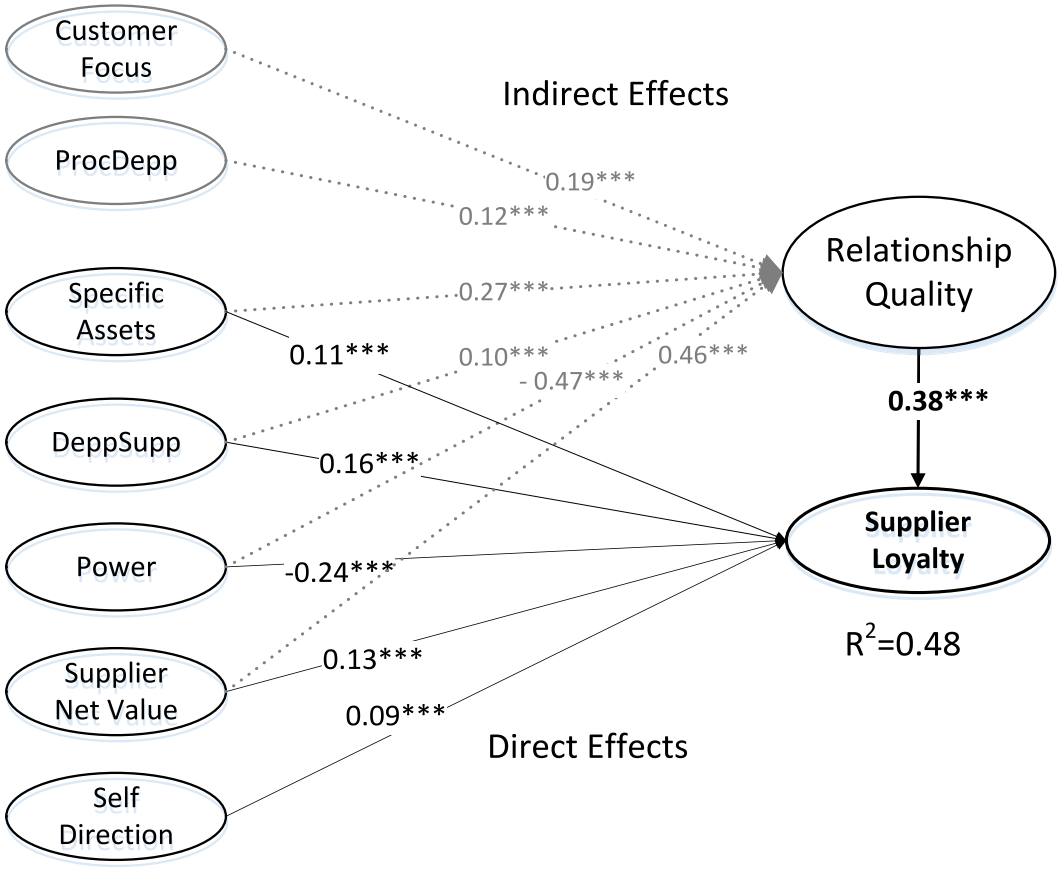

Figure 9-4: Antecedents of supplier loyalty

Supplier loyalty was strongly influenced by both supplier characteristics and relationship attributes. It is of note that neither supplier motivation nor ability affected supplier loyalty. These supplier characteristics may mean they deliver to the processor's specifications, but they will not necessarily be loyal. The relatively high R^2 value of 0.48 shows that the antecedents explain nearly half of the variation in loyalty. Furthermore, most of these relationships had a direct as well as an indirect effect through relationship quality. These effects show that some degree of loyalty can be realised without relationship quality.

The loyalty that occurs in the absence of relationship quality is likely to be related to calculative commitment (Gundlach et al., 1995). These suppliers are likely to be making a rational choice about the costs and benefits of being loyal to their processor, with an absence of an affective commitment based on relational quality.

In summary, although some degree of loyalty can be achieved without relationship quality, significantly higher levels of loyalty can be attained through building a closer relationship with suppliers. All the relationship attributes affect supplier loyalty. Self-direction and

customer focus were the only supplier characteristics involved. The number of antecedents and complexity of the direct and indirect relationships makes improving supplier loyalty difficult. To improve loyalty processors need to select suppliers who are self-directed and customer-focused. They also need to build quality relationships, ensure suppliers experience a positive net value, encourage supplier's investment in specific assets as well as build interdependence with their suppliers. Finally, they must avoid the use of power to prevent the substantial negative impact of this variable on loyalty.

9.1.4 Supplier communication

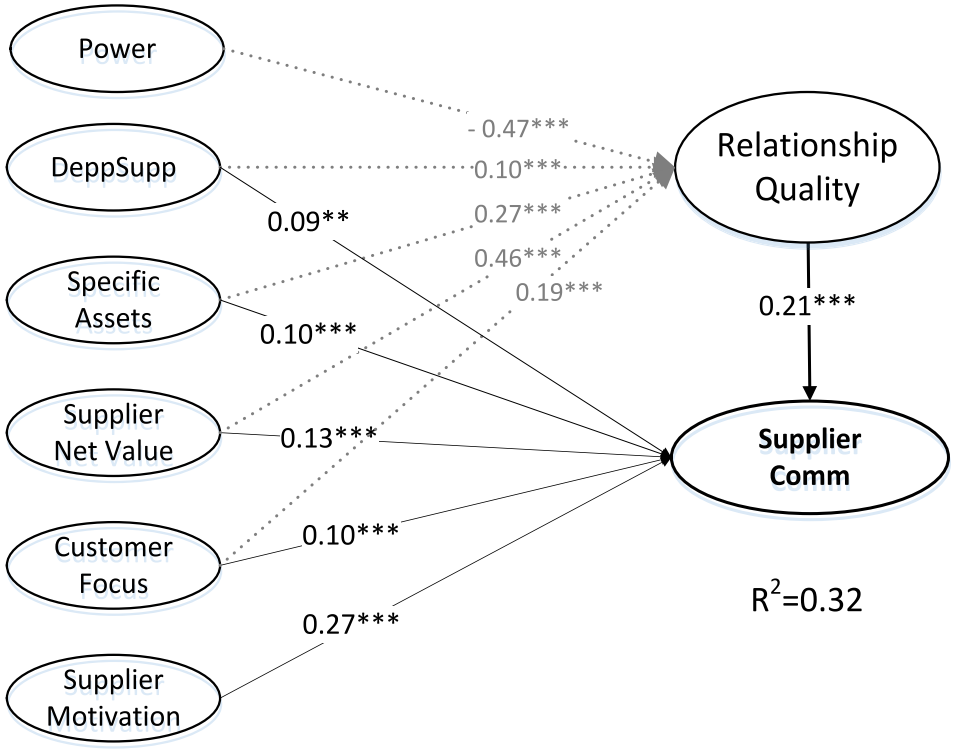

Figure 9-5: Antecedents of supplier communication

Supplier communication had both supplier and relationship variables as antecedents, with both direct and indirect effects (Figure 9-5). Suppliers who were motivated, who had a customer orientation, had made specific investments, were experiencing a net benefit from the relationship and who were dependent on the processor, were more likely to communicate and share information with the processor. These effects were independent of the quality of the relationship. All these variables with the exception of power and supplier motivation also had an impact through relationship quality. Power had a negative indirect effect. Therefore, improving relationship quality will further increase communication, however, this will be relatively small compared to the direct effects.

9.1.5 Supplier profitability

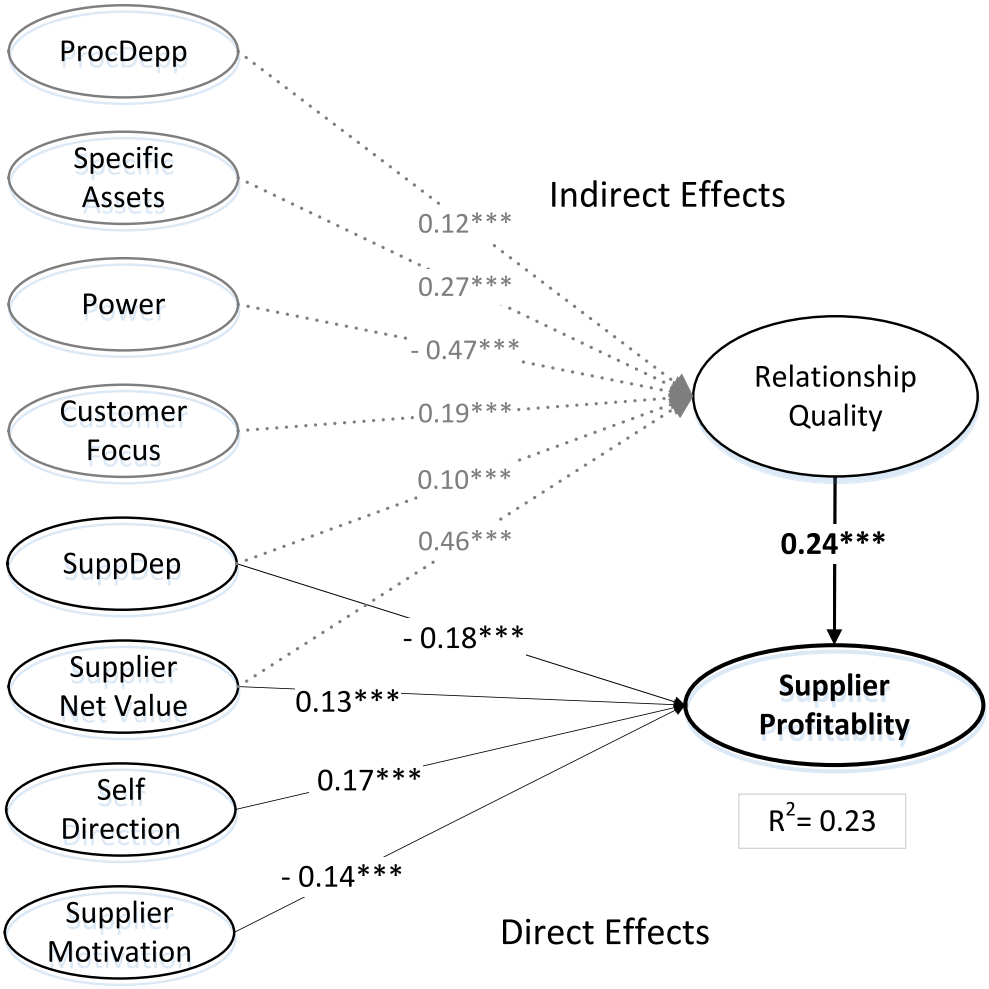

Figure 9-6: Antecedents of supplier profitability

Profitability is an important outcome both for both suppliers and processor. However, it has a complex set of relationships with supplier characteristics and relationship attributes (Figure 9-6). Supplier motivation and self-direction were the only antecedents that had a direct effect on profitability. Somewhat surprisingly, supplier motivation had a negative effect on profitability. This may indicate that their motivation is not to maximise profit but suggests they may have other priorities that may involve seeking recognition for the quality of their product or growing their farm business. There was some support for this in the fact that supplier motivation had a strong correlation with customer focus (0.42***).

Supplier dependence and supplier net value were the only variables that had both indirect and direct effects. Suppliers who experienced a positive net value from their supply

relationship will improve their farm profitability to some degree without a strong relationship with their processor. However, with relationship quality, this effect almost doubled its impact on farm profitability. This shows that relationship quality plays an important part in supplier profitability. This may be because suppliers were more comfortable making specific investments and adapting their production system to meet the processors' requirements.

Supplier dependence had a direct adverse effect on profitability. What is of note here was that there was a small positive indirect effect (0.02***) with mediation by relationship quality. This result suggests that without relationship quality, supplier dependence was detrimental to profitability. However, with an improved quality relationship with their processor, dependence had a small positive impact. This highlighted the fact that dependence exposed the supplier to the risk of opportunistic behaviour that was detrimental to their profitability. Furthermore, it provided evidence for the proposition that relationship quality had a mitigating effect on the risk of opportunistic behaviour.

The remaining four variables had only indirect effects on supplier profitability (Table 7-15). The positive effect of specific assets shows that suppliers benefit financially from adapting their production systems to meet the processors' requirements; this benefit was only realised with higher relationship quality. Conversely, the negative effect of power on profitability was only realised if there was an existing quality relationship with the processor.

In summary, higher levels of relationship quality will improve supplier profitability. Processors who wanted to improve supplier profitability, first needed to build stronger relationships with their suppliers and select suppliers with a high degree of self-direction and customer focus. Secondly, they needed to encourage investment in specific assets at the same time to help reduce dependence and avoid the use of power in the relationship. Finally, they needed to ensure suppliers experience positive benefits from the relationship.

9.1.6 Summary of antecedents of supplier performance

The results presented in this section show that the all the relationship attributes other than power and dependence had a positive effect on supplier performance. Dependence had a adverse effect only on supplier profitability and power had a negative effect on all the performance variable other than delivery quality.

The supplier characteristics also had mostly positive impacts on the performance variables except self-direction and motivation. Self-direction had negative effects on delivery quality and quantity. The negative effect of motivation was on supplier profitability. Relationship quality had a role in the interaction with nearly all the performance variables; delivery quality was the only exception. Though some of these effects were relatively small relationship quality did play a significant role in achieving some of the supplier performance variables. It had a major effect on all the relationship attributes and their effect on supplier loyalty. It also had a significant impact on the relationship between supplier net value and supplier profitability. Supplier communication was only moderately affected by relationship quality. The supplier characteristics in contrast were not influenced by relationship quality but had a direct influence on supplier performance. Customer focus was the only exception to this.

These results suggest that to improve supplier performance processors need to consider both supplier characteristics and relationship attributes. Utilising the supplier characteristics requires careful supplier selection. This process involves identifying and attracting suppliers who have superior farm management ability, a high level of motivation and customer focus. They also need to avoid suppliers with high levels of self-direction as they are less likely to meet their quality specifications. Furthermore, relationship quality plays an important role with the relationship attributes and their effect on supplier performance. Processors need suppliers to invest in specific assets, allow themselves to become dependent and received positive net benefits from the supply relationship. To do this, they need to try to influence these attributes but also develop strong relationships with these suppliers. They also need to avoid the use of coercive power even though specific assets and dependence may give the opportunity to do this.

9.1.7 Correlations

This section presents the correlations between each of the exogenous variables. These values identify variables that were highly correlated. Although this does not establish causation, it is possible to identify interdependent relationships between variables.

Table 9-1 : Correlations between exogenous variables

Variables			Estimate	P
Customer focus	<-->	Self-direction	-0.03	0.37
Customer focus	<-->	Supplier Motivation	**0.42**	***
Customer focus	<-->	Net Value	0.12	***
Customer focus	<-->	Power	**0.19**	***
Customer focus	<-->	Specific Assets	**0.36**	***
Customer focus	<-->	Processor dependence	0.17	***
Customer focus	<-->	Supplier Dependence	0.11	***
Customer focus	<-->	Supplier Ability	**0.26**	***
Net Value	<-->	Power	**-0.37**	***
Net Value	<-->	Processor dependence	0.03	0.26
Net Value	<-->	Supplier Dependence	0.1	***
Net Value	<-->	Supplier Ability	0.11	***
Power	<-->	Specific Assets	**0.68**	***
Power	<-->	Processor dependence	**0.23**	***
Power	<-->	Supplier Dependence	**0.29**	***
Power	<-->	Supplier Ability	0.03	0.38
Processor dependence	<-->	Supplier Dependence	0.11	***
Processor dependence	<-->	Supplier Ability	0.13	***
Self-direction	<-->	Supplier Motivation	**-0.14**	***
Self-direction	<-->	Net Value	**0.23**	***
Self-direction	<-->	Power	-0.2	***
Self-direction	<-->	Specific Assets	-0.1	***
Self-direction	<-->	Processor dependence	-0.09	***
Self-direction	<-->	Supplier Dependence	**-0.18**	***
Self-direction	<-->	Supplier Ability	0.03	0.41
Specific Assets	<-->	Processor dependence	**0.35**	***
Specific assets	<-->	Supplier Dependence	**0.47**	***
Specific assets	<-->	Supplier Ability	0.13	***
Supplier dependence	<-->	Supplier Ability	0.02	0.63
Supplier motivation	<-->	Net Value	0.13	***
Supplier motivation	<-->	Power	0.07	**
Supplier motivation	<-->	Specific Assets	**0.19**	***
Supplier Motivation	<-->	Processor dependence	0.14	***
Supplier Motivation	<-->	Supplier Dependence	0.13	***
Supplier Motivation	<-->	Supplier Ability	0.59	***

There were some significant correlations between variables that provided further insight into the relationships in the model. There was a strong correlation between customer focus and supplier motivation (0.42***), indicating that suppliers who were highly motivated were also likely to be customer focused. Furthermore, there was also a strong correlation

between specific assets and customer focus (0.36***). This would suggest that suppliers who were customer-focused were also more likely to invest in specific assets to achieve their goals. Self-direction had strong negative correlation with power (-0.19***) and a positive correlation with net value (0.22***). As self-directed suppliers make more independent decisions, therefore, they were less likely to enter into a relationship with asymmetrical power relationships. This outcome was confirmed by the negative correlation between self-direction and supplier dependence (-0.18***). Self-directed suppliers clearly wished to maintain their independence. The positive correlation with supplier net value indicates that these suppliers were more likely to enter into supply relationships where there were positive net benefits from the relationship. Processor dependence had a number of significant correlations including specific investments (0.35***), power (0.23***), supplier motivation (0.14***) and customer focus (0.17***). Processor dependence implied that the processor had become reliant on the supplier. Processor dependence and supplier dependence were positively correlated (0.11***). This result implies that, to some degree, interdependent relationships occur where both supplier and processor were dependent on each other. Processor dependence was likely to be a result of suppliers having specific characteristics that benefitted the processor. For example, suppliers who were highly motivated, customer-focused and who had made specific investments were likely to be highly valuable to the processor. As not all suppliers had these characteristics the processor then became dependent on these suppliers.

Supplier dependence has significant correlations with processor dependence (0.11***), specific investments (0.47***), power (0.28***), net value (0.12***), supplier motivation (0.13***), customer focus (0.12***), and a negative correlation with self-direction (-0.18). These correlations indicate that supplier dependence is increased by investment in specific assets which, in turn, result in power asymmetry. Motivated suppliers may be more willing to become dependent to achieve their goals. This relationship may also occur with customer focus. These suppliers may realise that dependence is the price to pay to meet customers' needs. This was supported by the correlation with net value. This relationship showed that supplier dependence was related to net value. The negative correlation with self-direction demonstrated that these suppliers will tend to remain independent only entering into a supply relationship if there were certain of positive net benefits.

Supplier ability was positively correlated with net value (0.12***), specific investments (0.13***), processor dependence (0.13***), customer focus (0.26***) and supplier motivation (0.59***). Most significantly, supplier ability and supplier motivation were strongly correlated. These suppliers also appeared to be more customer-focused and willing to make specific investments therefore were more likely to realise a positive net benefit from the relationship. The processor was likely to become more dependent on these supplier's due to their motivation and ability, customer focus and willingness to make specific investments.

9.1.8 Control variables

Table 9-2 shows the standardised regression weight and significance of the control variables and supplier performance outcomes. In the model, these were used as controls to remove their influence on the model variables. By analysing these relationships, it enabled identifying which of these would have a significant effect if included in the model.

Table 9-2: Regression weights for control variables – mediated model

Variables			Regression weight	P
DelNum	<---	Farm Size	0.03	ns
DelNum	<---	UncertProd8mth	0.11	***
DelQual	<---	Farm Size	-0.06	*
DelQual	<---	UncertProd8mth	0.08	**
FarmPerf	<---	ClimSpring	0.11	***
FarmPerf	<---	ClimSum	-0.03	ns
FarmPerf	<---	Farm Size	0.07	**
FarmPerf	<---	EducationMax	-0.09	***
FarmPerf	<---	SoilFert	0.06	**
FarmPerf	<---	ClimWint	-0.02	ns
Loyalty	<---	Shares	0.21	***
SuppCom	<---	Shares	0.06	**

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

There were a number of significant effects of the control variables. For example, farm performance was positively related to spring climate, farm size and soil fertility. These relationships indicate that a warm spring climate, a large farm size and high soil fertility all contribute to improved farm performance. A favourable spring climate resulted in early pasture growth, which enabled early lambing or calving. These farm characteristics enable stock to be produced on the shoulders of the season and consequently are able to attract a greater premium. Surprisingly, farm performance was negatively affected by educational level. This result seemed to infer that higher education did not necessarily result in improved

farm performance. Farming is a practical enterprise that involved considerable tacit knowledge. Education was also negatively correlated with age which may mean younger farmers with higher educational levels may have less on-farm experience. Owning shares was positively correlated with supplier loyalty and supplier communication. This result indicates that the existence of vertical integration by suppliers means they are more loyal and are more willing to communicate and share information.

Both delivery quality and quantity were affected by production uncertainty. This suggests that uncertainty in production made it more difficult to deliver the quality and number of stock required. This was likely because where production uncertainty existed there was increased risk of not being able to meet the processors' requirements. These suppliers will require greater flexibility in the quality and timing of delivery.

9.2 Summary of results and conclusions

Table 9-3 presents a summary of the results of hypotheses proposed in Table 3-1. A considerable number of these hypothesis were supported suggesting that the theoretical model substantially supported by the empirical analysis. Table 9-3 presents the outcome of the hypotheses proposed in Table 3-1 and Figure 3-9. The first series of hypotheses evaluated the structure and connection of relationship quality and social capital. The only one of these propositions not supported was that relationship quality and social capital were distinct constructs. The six other propositions were all supported. These results confirmed the structure of these two constructs and that they were not in fact significantly different concepts. The other supported hypotheses provided evidence that relationship quality and social capital could be configured in multiple ways that were equally valid.

Table 9-3: Hypotheses outcomes

H1a-g: **Relationship quality** is a construct with the sub-dimensions of: Structural social capital, relational/cognitive social capital, trust, commitment, satisfaction with communication, satisfaction with price and satisfaction with the organisation.	**Supported**
H2a: Social capital and relationship quality are distinct constructs	Not supported
H2 b,c: **Social capital** made up of sub-dimensions of structural and relational/cognitive social capital.	**Supported**
H2g-1: **Satisfaction** is made up of sub-dimensions that include satisfaction with performance, communication and price.	**Supported**
H2d-i: **Relationship quality** made up of sub-dimensions of trust, commitment and satisfaction.	**Supported**
H3a-g: **Relationship quality** is a construct that consists of social capital, trust, commitment and satisfaction.	**Supported**
H4a-g: **Social capital** is a construct that consists of social relationship quality, trust, commitment and satisfaction.	**Supported**
H5a Relationship quality mediates the positive effect of **supplier dependence** on delivery quality.	Not supported
H5b Relationship quality mediates the positive effect of **supplier dependence** on delivery quantity.	**Supported (indirect effect)**
H5c-e: Relationship quality mediates the positive effect of **supplier dependence** on, supplier loyalty, supplier communication, supplier profitability.	**Supported (partial mediation)**
H6a: Relationship quality mediates the positive effect of **[processor] dependence** on delivery quality.	Not supported
H6b-e: Relationship quality mediates the positive effect of **[processor] dependence** on delivery quantity, supplier loyalty, supplier communication and supplier profitability.	**Supported (indirect effect)**
H7a: Relationship quality mediates the positive effect of **specific assets** on delivery quality.	Not supported
H7b: Relationship quality mediates the positive effect of **specific assets** on delivery quantity, and profitability.	**Supported (indirect effect)**
H7c-e: Relationship quality mediates the positive effect of **specific assets** on supplier loyalty, supplier communication.	**Supported (partial mediation)**
H8a: Relationship quality mediates the negative effect of **power** on delivery quality.	Not supported
H8b: Relationship quality mediates the negative effect of **power** on delivery quantity.	**Supported (indirect effect)**
H8c: Relationship quality mediates the negative effect of **power** on supplier loyalty.	**Supported (partial mediation)**
H8d: Relationship quality mediates the negative effect of **power** on supplier communication.	**Supported (indirect effect)**
H8a-e: Relationship quality mediates the negative effect of **power** on supplier profitability.	**Supported (full mediation)**
H9a Relationship quality mediates the positive effect of **supplier net value** on delivery quality.	Not supported
H9b Relationship quality mediates the positive effect of **supplier net value** on delivery quantity.	**Supported (indirect effect)**
H9c-e: Relationship quality mediates the positive effect of **supplier net value** on supplier loyalty, supplier communication and suppler profitability.	**Supported (partial mediation)**
H10a: Relationship quality mediates the positive effect of **customer focus** on delivery quality.	**Supported (direct effect)**
H10b: Relationship quality mediates the positive effect of **customer focus** on delivery quantity, profitability and supplier loyalty.	**Supported (indirect effect)**
H10c-d: Relationship quality mediates the positive effect of **customer focus** on, supplier communication.	**Supported (partial mediation)**
H10e: Relationship quality mediates the positive effect of **customer focus** on supplier profitability.	**Supported (indirect effect)**
H11a-b: Relationship quality mediates the positive effect of **supplier ability** on delivery quality, delivery quantity.	**Not supported (direct effect only)**
H11c-e: Relationship quality mediates the positive effect of **supplier ability** on, supplier loyalty, supplier communication and supplier profitability.	**Not supported (no effect)**
H12a-e: Relationship quality mediates the positive effect of **supplier motivation** on delivery quality, delivery quantity, communication, loyalty and profitability.	**Not supported (direct effects only) Negative effect on profitability**
H13a-c: Relationship quality mediates the positive effect of **supplier self-direction** on delivery quality, delivery quantity, supplier and loyalty.	**Not supported (direct effects only) Negative effect on delivery quantity**
H13d: Relationship quality mediates the positive effect of **supplier self-direction** on supplier communication.	**Not supported (no effect)**
H13e: Relationship quality mediates the positive effect of **supplier self-direction** on supplier profitability.	**Not supported (direct effect only)**

The remainder of the hypotheses proposed that relationship quality mediated the interaction between supplier characteristics, relationship attributes and supplier performance. Most of these hypotheses were supported. This result provides evidence that relationship quality plays a significant role in mediating the effect these variables on supplier performance. There were, however, a number that were not supported. For example, none of the propositions involving delivery quality were supported. This variable had only direct effects on supplier performance. This suggests that relationship quality has no effect on suppliers delivering a quality product. The other propositions that were not supported involved supplier motivation, ability and self-direction. These variables had a number of direct effects on supplier performance, but relationship quality did not influence their impact on supplier performance. These results confirm that relationship quality does play a major role in influencing supplier performance. However, this is mostly with relationship attributes as there are a number of the supplier characteristics that have no influence from relationship quality.

Chapter 10: Discussion and conclusion

10.1 Introduction

The preceding chapters have explained the context and purpose of the research, reviewed the relevant literature, described the research methodology and presented the results of the data analysis. This discussion chapter addresses the central aim of this research which was to investigate buyer-supplier relationships in order to improve supplier performance. This is achieved by addressing each of the research questions in the light of the results. Section 10.2 contains a discussion on the question regarding the conceptualisation and measurement of relationship quality and its connection to social capital. Following this, Section 10.3 presents an evaluation of the relationship and supplier variables that were found to be antecedents of relationship quality. Section 10.4 then considers the manner in which supplier characteristics, relationship attributes and relationship quality interact to effect supplier performance**.** Some possible ways that processors can influence supplier performance is discussed within each section. Section 10.5 summarises the discussion and conclusions. Finally, Section 10.6 discusses the theoretical and managerial contributions of the research, the limitations of the thesis and directions for future research.

10.2 Conceptualisation and dimensional structure of relationship quality

The first research question addressed the structure and conceptualisation of relationship quality. The results showed little difference in model fit and p values between the various models of relationship quality and social capital. This outcome was not surprising given the high correlations between social capital and relationship quality. The finding implies that the respondents did not discriminate between the scale items that make up social capital and relationship quality[34]. They did however distinguish between social capital and the other dimensions of relationship quality (trust, commitment and satisfaction). The implication is that relationship quality can be understood as a higher-level construct that has four distinct dimensions including social capital, as well as trust, commitment and satisfaction (Figure 7-3). Furthermore, social capital has two dimensions structural and relational/cognitive social capital; the results indicated that it would be equally valid to include relationship quality as a third dimension (Figure 7-4). The exploratory factor analysis also failed to

[34] Although suppliers may not relate to the constructs such as social capital and relationship quality they identify the scale items that make these up.

separate relational and cognitive social capital (Table 6-2) suggesting that the respondents did not differentiate between these two constructs. In addition, the satisfaction construct has three dimensions, which are satisfaction with price, communication and the organisation. A significant outcome of the research was that social capital could be a dimension of the relationship quality construct (Figure 7-3), and that it would be just as valid to include relationship quality as a dimension of social capital.

Combining relationship quality and social capital provides a broader measure of the relationship resources included in buyer-seller relationships. While the empirical research on relationship quality has not explicitly included social capital in its dimensions, there are a number of authors who define relationship quality in broad terms that reflects the "overall strength of a relationship" (Lages et al., 2005, p. 1041). Based on this perspective it can be argued that social capital measures important aspects of the overall strength of the relationship which are not included in the other relationship quality dimensions.

Empirical evidence that relationship quality and social capital are highly related constructs is rare. There is, however, some justification for this in the literature. For example, there are studies in the relationship marketing literature have included constructs similar to social capital in the formulation of relationship quality. For instance, they incorporate the construct "similarity" which is defined in terms of relationships with similar cultures, values and goals. This definition is almost indistinguishable from the cognitive social capital construct (Table 4-20). Furthermore, relationship quality variables similar to social capital constructs can be seen in the work of Dwyer et al. (1987) and Morgan and Hunt (1994) who refer to shared values and similarity of beliefs as being necessary for relationship development. In a similar way, reciprocity and relational bonds (relational social capital) were studied in the context of relationship quality by Wulf and Odekerken-Schröder (2001). Finally, structural social capital is captured in a number of studies by incorporating frequency of interaction with customers (Bagozzi, 1995; De Wulf, Odekerken-Schröder, & Iacobucci, 2001). These studies suggest that there is theoretical support for this view of social capital and relationship quality as being closely related hence should not be treated as separate constructs.

The findings of this research were somewhat novel in bringing together concepts from the relationship marketing and the social network perspective. This approach enabled a broader definition of relationship quality to be used in the structural equation modelling analysis of

this research. As a result, a more comprehensive measure of the overall strength of the relationship was able to be modelled.

10.3 Antecedents of relationship quality

The second research question aimed to identify the antecedents of relationship quality (Figure 7-6). First of all, the results showed that the supplier and relationship variables in the model captured a significant amount of the variation in relationship quality (R^2 value of 0.60). The significant antecedences ($p<0.001$) identified were supplier and processor dependence, specific assets, power, net value, and customer focus. Power (-0.47***) and net value (0.46) had the greatest influence on relationship quality followed by specific assets (0.27***) and customer focus (0.19***). Supplier (0.10***) and processer dependence (0.12***) had the least significant influence. The supplier characteristics of self-direction, supplier motivation and ability had no significant influence as antecedents to relationship quality.

These results are similar to those identified by Athanasopoulou (2009) who reviewed the literature on relationships quality and noted that there was considerable variation in the antecedents of relationship quality in the literature. Despite this, a number of factors were common to a large number of studies (Table 10-1). Most of these variables were incorporated into this research, though in some cases they were included as outcomes of relationship quality rather than antecedents or as control variables. For example, environmental uncertainty was treated as a control variable as was the duration of the relationship. The reason for this was because this research focused specifically on relationship quality and attributes, supplier characteristics and performance; this required controlling for variables such as environmental uncertainty. As noted earlier, variables such as effective communication and information sharing were included as supplier performance variables and therefore were an outcome of relationship quality rather an antecedent. Most of the remainder of the variables were essentially the same as Athanasopoulou (2009) reported from the literature. Hence, this research aligns with many previous studies on relationship quality. For example, the positive relationship between specific investments and relationship quality is consistent with the findings of Anderson and Weitz (1992), as was the positive relationship between dependence and relationship quality. Furthermore, they established a positive relationship between relationship termination costs, relationship benefits and commitment. Relationship termination costs can be related to specific assets

and relationship benefits to supplier net value. Although Morgan and Hunt (1994) only use the commitment dimension of relationship quality, commitment is likely to be closely correlated to the broader relationship quality construct used in this research.

Table 10-1: Commonality of antecedents between research and previous studies

Antecedents identified from the literature	Antecedents found in this research
Specific investments	Included
Level of environmental uncertainty	Control variable
Effective communication and sharing of information,	Included as outcome of RQ
Mutual dependence	Supplier and processor dependence included as separate variables
Perceived benefits and costs	Included as supplier net value
Shared goals	Included in definition of RQ
Duration of the relationship	Control variable
Absence of opportunistic behaviour	Included as Power
Customer focus	Novel to this research

As an antecedent of relationship quality, customer focus was a novel variable that has not previously been identified in this capacity in the literature. This may be because it is a supplier characteristic rather than relationship variable and most research has focused on relationship factors. This research provides some evidence that supplier characteristics such as customer focus can influence relation quality. By implication, buyers may be able to improve relationship quality by selecting suppliers who are customer focused. It is also important to note that none of the other supplier characteristics contributed to relationship quality including supplier ability and self-direction. Further research could seek to identify supplier characteristics other than customer focus that may impact relationship quality. This would provide greater insight into other supplier characteristics that buyers could use to select suppliers who are more likely to build higher quality relationships. For example, Athanasopoulou (2009) identified relationship orientation as an important characteristic of both supplier and buyer that influences relationship quality.

10.4 The effect of supplier characteristics, relationship attributes and relationship quality on supplier performance

The remainder of the research focused on testing the theoretical model (Figure 7-5). This model addressed the research questions focused on identifying which supplier and relationship attributes affected supplier performance and how relationship quality influences these relationships. In discussing these questions there is consideration of how

processors might influence supplier performance by understanding these relationships[35]. To achieve this the discussion covers, firstly, an explanation of the direct (unmediated) effects between the supplier characteristics, relationship attributes and supplier performance. After this, relationship quality is included as a mediator to understand how this affects these relationships. Following this, the discussion evaluates each of the supplier and relationship variables and their effect on supplier performance. Finally, the supplier and relationship antecedents of each of the supplier performance outcomes are discussed.

10.4.1 Unmediated (direct) effects on supplier performance

The first step in this process was to identify the unmediated direct effects between the relationship attributes, supplier characteristics, and supplier performance (Figure 7-9). This analysis showed positive, negative as well as non-significant effects on supplier performance. For example, processor dependence had no significant direct effect on any of the performance variables (Table 7-11). In contrast, all other variables affected at least two of the supplier performance outcomes. Supplier net value, supplier dependence, supplier motivation and self-direction had the greatest impact, influencing at least four of the supplier performance outcomes (Table 7-11). Furthermore, some of these factors explained a considerable proportion of the variance in the supplier performance outcomes. For example, supplier loyalty ($R^2 = 0.42$) and supplier communication ($R^2 = 0.32$) had the highest values. Supplier profitability ($R^2 = 0.22$), delivery quantity ($R^2 = 0.20$) and delivery quality ($R^2 = 0.16$) all had less of an influence. This confirmed that both relationship and supplier variables have significant direct effects on supplier performance. The strength and effect of these antecedents varied considerably with no two variables having the same relationship with the performance outcomes. This means it is important to understand the individual effects of each of the antecedents and their impact on supplier performance. The next stage of the research was to evaluate the impact of relationship quality as a mediator on these relationships.

10.4.2 Mediated (indirect) effects

Adding relationship quality as a mediator had a significant impact on the effects of the supplier and relationship variables on supplier performance. For example, the R^2 value

[35] Though the study was focused on the supplier's perspective on the relationship and self-reporting on supplier characteristics and performance it is possible to speculate as to how these may affect processors even though this cannot be specifically proven from the data.

increased for several of the supplier performance variables including supplier loyalty, profitability, and communication. This suggests that there is an increase in the explanatory power of the model when relationship quality is included, though the goodness-of-fit measures were essentially unchanged. A number of the direct effects decreased in value implying partial mediation by relationship quality. Consequently, the model showed several mediated effects through relationship quality. Relationship quality also had a direct effect on all the supplier performance outcomes with the exception of delivery quality. This confirmed hypotheses H5 – H13 that relationship quality plays an important mediating role between the relationship and supplier characteristics and the performance outcomes (Table 9-3). Furthermore, the relationship characteristics variables were all antecedents of relationship quality. In contrast, customer focus was the only supplier characteristics that influenced relationship quality. This suggests that relationship quality has a greater mediating role with relationship attributes than with than with supplier characteristics. This is similar to the findings of Morgan and Hunt (1994) who identified that relationship quality, which they defined as trust and commitment, was an important mediating variable between a number of antecedents, such as relationship termination costs, relationship benefits and performance outcomes. Carey et al. (2011) also found that the antecedents of supplier performance were partially mediated by relational capital.

These results provide insights into the complex interactions that exist in supplier – buyer relationships. Each independent variable has a unique combination of associations with the supplier performance variables. This makes any easy summarisation of results difficult. It does however reflect the existing understanding of intangible relationship resources whereby these are these are characterised by complexity and causal ambiguity (Morgan & Hunt, 1994). Furthermore, Nahapiet and Ghoshal (1998) state that it is this complexity which enables buyers who develop these resources to gain a sustainable competitive advantage.

10.4.3 Supplier characteristics

The supplier characteristics had considerable effects on supplier performance. These were mostly unmediated, direct effects on supplier performance. This means that their influence on supplier performance was independent of the quality of the relationship (Table 7-15). This suggests that for the supplier characteristics, relationship quality does not have a major impact on supplier performance. Furthermore, these supplier characteristics are likely to be based on the supplier's capabilities and personality, which are difficult to change. All the

supplier characteristics had positive effects on performance with the exception of self-direction and motivation. This suggests that buyers may need to put emphasis on supplier selection if they want to get the full benefit of these supplier characteristics.

Customer focus

Customer focus was an important supplier characteristic affecting supplier performance. This was because it was the only supplier characteristic that had indirect effects on supplier performance (mediated by relationship quality). Though these effects were relatively weak (range 0.02** to 0.07***) they still indicate that relationship quality plays a significant mediating role in the effect that customer focus has on supplier performance. The indirect effects had significant relationships with all the supplier performance variables other than delivery quantity. In contrast, the direct effects only affected communication and delivery quality (Figure 8-3). Between the direct and indirect effects customer focus affected all the supplier performance outcomes, illustrating the importance of customer focus as a supplier characteristic.

Loyalty and profitability were not directly affected by customer focus however, they were affected by customer focus when relationship quality as a mediator. This result suggests to achieve loyalty and profitability customer focused suppliers also need a strong relationship with the buyer. This link to profitability was consistent with research by Narver and Slater (1990) who found that market (customer) orientation was an important determinant of supplier profitability. This was also consistent with previous findings by Micheels and Gow (2008) and Verhees and Meulenberg (2004) who show that market (customer) orientation improved supplier performance. Micheels and Gow (2009), also note the difficulty in developing customer orientation in the meat industry due to the complex nature of agricultural production and the length of the supply chain. This may explain the weaker effect that customer focus has on performance compared to some of the other supplier characteristics. The conclusion from these results provides evidence that customer focus is an important supplier characteristic variable, which impacts all the supplier performance variables. Therefore, improving supplier performance requires suppliers who are customer focused suppliers and who have high-quality relationships with their buyers.

Motivation

Motivation positively influences supplier communication as well as delivery quality and quantity. Somewhat surprisingly, however, it had a negative effect on profitability (Figure 8-4). This at first seems counterintuitive as it would be expected that motivated suppliers would be more likely to be more profitable. A potential explanation is that profitability may not be the only objective that highly motivated suppliers aim to achieve. This is consistent with the findings of Elliott and Wakelin (2016) and Wilson et al. (2012) who found that farmers were motivated by a range of factors with profitability being a means to achieving these objectives rather than a goal in itself. Figure 10-1 may also provide some explanation. This graph shows an inverted U relationship between dependence and motivation. At one end, low levels of dependence are associated with moderately motivated suppliers. Then moderate levels of dependence corresponds to low levels of motivation. Finally, high levels of dependence on the processor are associated with high levels of motivation. As high levels of dependence are likely to decrease profitability, this may impact on these high motivation/high dependent suppliers.

Figure 10-1: Relationship between dependence on the processor and supplier motivation.

Motivated suppliers may accept a more dependent relationship as this provides them with other benefits even though it may affect their profitability. There is some evidence of these benefits in the positive relationship between supplier motivation and net value (0.15***). This relationship shows that these suppliers are receiving significant benefits from the relationship even though they are not measured in terms of profitability. For example, these

suppliers may receive strategic benefits from the relationship such as reducing market risk or accessing new technologies. As a result, they may be willing to accept a reduction in financial return. The suppliers with low levels of dependence but who have moderate levels of motivation may represent a group of motivated suppliers who are wary of being dependent on the processor because of the potential negative effects of dependence.

Further evidence is presented in Table 10-2 which shows the correlation between the individual scale items for supplier motivation and profitability. This gives some indication of why motivated suppliers are likely to have lower profitability. The three items that have a significant negative correlation with profitability all relate to striving to improve animal production, quality of stock and farm performance (Table 10-2). This suggests that these suppliers may be investing to improve these factors and this may impact on short term profitability. For example, a farmer who want to increase the number of stock on his farm needs to hold back stock from sale or buy in stock which will decrease revenue in the short-term.

Table 10-2: Correlation coefficients between individual scale items for supplier motivation and supplier profitability.

Dimension	Code	Description	Correlation with supplier profitability
Farm	SuppPerf1	We continually strive to improve our farm performance.	-.12**
Quality stock	SuppPerf2	We continually strive to improve the quality of our stock.	-.09**
Animal production	SuppPerf3	We continually try to improve our farm performance by improving yields (animal production).	-.10**
Quality stock	SuppPerf5	We would aim to produce the best quality stock even if we were not able to get a premium for it.	-0.02 ns
Efficiency	SuppPerfF6	We have consistently managed to improve our farm efficiency.	-0.04 ns
Higher market returns	SuppPerfF7	Regarding you and your farm business? We continually try to improve our farm performance by achieving higher market returns for our products.	0.02 ns
These items were measured using a 6 point Likert scale ranging from: Strongly *agree* to *strongly disagree*.			

Another explanation of the negative relationship between motivation and profitability could be that it is the result of measurement error. Though the construct is labelled motivation, it may in fact be measuring something else. In the CFA, there were some issues with convergent validity (Table 6-16). This indicates that the construct may be measuring more than one thing. This can also be seen with Table 10-2 where three items have a significant

negative association with profitability and the other three have no significant relationship. More work needs to be done on this construct to clarify what it is in fact measuring.

A motivated supplier's willingness to communicate with the processor is also likely to be related to this desire to achieve the quality outcomes as this helps them align their quality and delivery with the processor's requirements. Supplier motivation is likely to be a valuable supplier characteristic from the processors perspective because of its effect on the quality outcomes and communication. The negative association with profitability, indicates that processors may need to ensure that these suppliers are sufficiently rewarded for their efforts. It may be also important that processors can achieve a sufficient market premium for their quality requirements. Without this, it is possible that the returns to suppliers will be insufficient to justify their extra costs and effort, and this may affect their long term financial viability.

Supplier ability

The results showed that the supplier's management ability had no direct or indirect effects on profitability, loyalty or communication (Figure 8-5). This implies that ability is not a guarantee of performance and other factors may be of greater importance especially in regard to loyalty and communication. Supplier ability was the only variable that affected the two quality outcomes. This suggests that supplier ability effects the supplier's capability to meet the processors requirements for quality and delivery. The lack of mediated effects implies that relationship quality is not associated with a supplier's capacity to achieve these quality outcomes. Furthermore, there are no mediated or unmediated interactions with the other performance variables. These results are consistent with the study by Kannan and Tan (2002) who established that supplier capability was positively correlated with product quality. They also note that quality variables are operational in nature and therefore less likely to be influenced by relational factors.

It is of note that there is no significant relationship between supplier ability and profitability. It might be expected that more capable suppliers would also be more profitable due to their superior farm management ability. However, these results show that supplier profitability is not improved by either the supplier's ability or motivation. Though the result could potentially be affected by measurement errors, there is some evidence for this relationship. For example, Kannan and Tan (2002) also found that factors such as a suppliers willingness

to share information and their commitment to the buyer were more important to supplier performance than supplier capability.

Self-direction

Self-direction is associated with independent thought and action (Schwartz & Bilsky, 1990). This variable showed a negative effect on delivery quantity and quality plus a positive influence on the supplier profitability and loyalty. These results suggest that when making decisions about quality and delivery timing, self-directed suppliers focus on maximising profitability. The difference in the effects on performance of the different supplier characteristics discussed so far indicates that suppliers pursue divergent goals. Some suppliers, such as those who are self-directed choose to maximise profitability while others, such as the motivated suppliers, aim to meet the processor's quality requirements but at a cost to their profitability. While there is little research on self-direction and supplier performance, a study by Parminter and Perkins (1997) showed that self-directed farmers have values which include a desire to see the results of their own efforts, being self-reliant and flexible in managing time. These results are supported by the negative correlation found between self-direction and supplier dependence, processor power and specific investments. These correlations suggest that self-directed suppliers want to act independently and avoid becoming dependent on the processor. Consequently, self-direction benefits the supplier in terms of increased profitability, however, it has a negative effect on delivery quality and quantity. In this way, this variable creates a tension between what is best for the processor and what is best from the supplier's perspective.

This difference between profitability and delivering to the processors' specifications indicates that attempting to meet these may not be the most economically rational strategy for suppliers. A self-directed supplier's sense of control over their destiny was more likely to mean they will make economically-rational decisions about when to sell stock. In New Zealand's dry land pastoral agricultural system stock are used to balance pasture supply and demand. One strategy is to sell stock when it becomes dry and retaining or buying in stock when there was a surplus of pasture. Therefore, it may be difficult to meet or time processors' needs and specifications as well as balance on-farm management objectives. Often processors are supplying to customers who wanted a consistent year-round supply or specific numbers and quality of product at a certain time. This may be in conflict with farm management priorities. Self-directed farmers were likely to be more confident in their ability

to achieve a good price when trading stock on the spot market or negotiating with the processor. Less self-directed suppliers may look for a closer relationship with the processor to mitigate market risks and may accept lower farm profitability as a trade-off for reduced uncertainty.

Supplier selection

The results of the supplier characteristics discussed above confirmed the importance of identifying supplier characteristics as a way to improve supplier performance. It also identifies some important characteristics that could potentially help processors when selecting suppliers. The results of this study are consistent with a number of previous studies that show the importance of supplier selection for performance (Kannan & Tan, 2002; Vonderembse & Tracey, 1999; Zeydan, Çolpan, & Çobanoğlu, 2011). However, while there is considerable literature on supplier selection criteria, most of these studies are from manufacturing industries (Choi & Hartley, 1996; Wilson, 1994). Some of the specific supplier characteristics in this study have also been identified in other research. For example, Bensemann et al. (2011) found that more committed suppliers in lamb supply chains were likely to have high market focus (customer focus) and low autonomy scores (self-direction). In another study Wilson (1994) indicates that a supplier's customer orientation is an important selection criteria. Finally, Kannan and Tan (2002) established that supplier capability (ability) ranked among the more important selection criteria used by buying firms.

Supplier selection is clearly an important activity based on the link between supplier characteristics, supplier performance and a buyer's competitive advantage. It becomes more important as processors become increasingly dependent on their suppliers. As a result, supplier management becomes more important. This not only includes supplier selection, but also supplier development and evaluation of performance (Kannan & Tan, 2002; Prajogo, Chowdhury, Yeung, & Cheng, 2012). The results of this current study suggest that to improve performance, supplier selection needs to focus on suppliers with high levels of customer focus, motivation and ability and low levels of self-direction.

10.4.4 Relationship attributes

In contrast to the supplier characteristics, the relationship attributes had a considerable number of indirect as well as direct effects. This signifies that relationship quality is more important for the relationship attributes than the supplier characteristics.

Processor and supplier dependence

Dependence between suppliers and processors is a sign that the other party has valuable resources required by the other and that there is limited availability of alternatives. Both supplier dependence and processor dependence affected the same performance variables. These were supplier profitability, communication, delivery quantity and loyalty (Figure 8-7 and Figure 8-8). The only performance variable that was not affected by either was delivery quality. The difference between processor and supplier dependence was in the strength and direction of the effects, as well as the level of mediation by relationship quality. For example, the results showed that supplier dependence influenced supplier performance directly, as well as with mediation by relationship quality (Figure 8-8). Supplier dependence had the greatest effect on supplier loyalty with strong direct and indirect effects. This direct effect suggests that dependent suppliers may still be loyal even if they have a poor relationship with their processor. The direct effect is likely to be based on a lack of alternatives rather than an independent choice based on a valued relationship with the processor. This result is similar to that found by Sriram and Mummalaneni (1990). The mediated effect of supplier dependence indicates that, with an improved relationship with the processor, suppliers will have an even higher level of loyalty.

The other indirect effects were relatively small and therefore indicate that relationship quality did not play a major mediating role between supplier dependence and supplier performance (other than supplier loyalty). In addition to loyalty, there were significant direct effects on supplier communication and profitability. Of particular significance was the negative impact of supplier dependence on profitability. This negative direct effect (-0.16***) indicates that although dependence may improve supplier communication (0.11**) and loyalty (0.20***) it was detrimental to the supplier's profitability. This is consistent with the findings of Heide and John (1988) who showed that financial performance was improved as dependence decreased. This suggests that suppliers should be cautious about becoming too dependent on their processor. Although supplier dependence may result in positive outcomes for the processor in terms of loyalty, communication and delivery quality, this effect is negative from the perspective of the supplier's economic performance. It is significant that mediation by relationship quality reverses this effect. While the mediated effect was small (0.02***) this positive indirect effect on profitability shows that a quality relationship with the buyer can moderate the negative impact on supplier profitability.

Processor dependence had no direct effects on supplier performance, however, it had weak indirect effects on the same variables as supplier dependence. This included positive relationships with loyalty, communication, delivery quantity and profitability. Though these effects were weak, it shows that processor dependence only effects supplier performance when there is a positive relationship with the processor. The positive effect of processor dependence on relationship quality was consistent with previous research by who found that buyer dependence had a positive impact on relationship quality.

The results discussed in this section indicate that supplier and processor dependence are important for supplier performance. They also suggest that suppliers face a dilemma. By forming a dependent relationship, they improve their performance in terms of loyalty and communication. However, as dependence increases, they are vulnerable to the negative effect of this on their financial performance. In some cases, suppliers may have little choice as there are few alternatives. Nonetheless, it is clear that a quality relationship combined with a level of processor dependence moderates the negative effect profitability.

Specific assets

Many of the impacts of specific assets on supplier performance were similar to those exhibited by supplier dependence (Figure 8-9). This was seen by the positive direct effect on communication and the strong direct and indirect effects on loyalty. Though there was no negative effect on supplier profitability. This similarity between specific assets and supplier dependence is not surprising given the high correlation (0.47***) found in this current study between these two variables. This result was also consistent with the work of Heide and John (1988) and Payan and Svensson (2007). One of the main differences was that relationship quality played a much greater role with specific assets than with supplier dependence. Specific assets had indirect effects ranging from (0.04***) for delivery quantity to (0.07***) for profitability. This positive indirect effect of specific assets on profitability is in contrast to the negative direct effect on profitability as was found with supplier dependence. This may explain some of the supplier's dilemma regarding dependence on the processor. Investment in specific assets has a positive effect on supplier profitability (0.07**), however, because they can also create dependence on the processor, suppliers then become vulnerable to the potential negative effect on profitability caused by dependence (Ganesan, 1994). The significant role played by relationship quality suggests that it is an important variable mediating the impact of specific assets on supplier

performance. These results indicate that increasing relationship quality when there are investments in specific assets will improve delivery quantity and profitability as well as further increasing loyalty and communication.

A considerable number of studies have shown that investing in specific assets enable firms to reduce production costs, meet product specifications, innovate and produce differentiated products (Dyer, 1996; Ebers & Semrau, 2015). These findings are consistent with this research, for example, Yeung et al. (2013) found that the relationship between supplier partnership and operational cost performance was strengthened by specific investments. Furthermore, the strong relationship between specific assets and relationship quality (0.27***) is consistent with research by Palmatier et al. (2006) who found that relational investments were one of the most influential factors affecting relationship quality.

Investment in specific assets are important for both suppliers and processors, however they also create risks for the supplier associated with dependence. Relationship quality plays an important part in ensuring that investment in specific assets are translated into performance benefits for the processor. It is also important for the supplier to realise the financial benefits of their investment. Relationship quality is also important for mitigating the risk of opportunistic behaviour associated with specific investments. For example, Dyer and Singh (1998) demonstrated that relational capital reduced the expectation of opportunistic behaviour and increased the confidence of both parties.

Power

Power had a consistent negative impact on all the supplier performance variables with the exception of delivery quality (no effect). The most harmful effect was between power and supplier loyalty. This had a large negative direct effect (-0.24***) and also a negative indirect effect (-0.18***) resulting in a total effect of (0.42***). This is consistent with a considerable body of research on the impact of coercive power in buyer/supplier relationships. For example, Maloni and Benton (2000) demonstrated a significant negative effect of coercive power on buyer supplier relationships and that stronger buyer supplier relationships had a positive effect on supplier performance. In this research power was also highly correlated with specific assets (0.68***) and supplier dependence (0.28***) which indicates that it is specific assets and dependence which provide the basis to exert coercive power in the supply relationship (Ganesan, 1994). This further illustrates the dilemma for the supplier. Their investment in specific assets benefits their performance, including profitability.

However, it also creates dependence on the processor and therefore causes vulnerability that the processor may use coercive power. Such findings suggest that processors need to be very careful in their use of power even though specific investments and dependence may provide them with the opportunity to do so. Use of coercive power may achieve short term benefits for the processor, but in the long run, this will be detrimental to supplier relationships and performance.

Supplier net value

Supplier net value had a strong influence on both relationship quality and supplier performance. In fact, supplier net value was second only to power in terms of its impact on supplier performance. Supplier net value had a direct impact on supplier loyalty (0.13***), supplier profitability (0.13***) and supplier communication (0.13***). All three of these variables also had strong indirect effects through relationship quality. In contrast to these variables, delivery quantity was only affected indirectly (0.06**) and there was no effect on delivery quality. These results highlight the importance of supplier net value on performance and also the significant role played by relationship quality. Supplier net value is important because it reflects the strategic benefits the suppliers receive in relation to the costs and risk involved in the relationship. These are non-financial costs such as increased management effort and stress and non-financial benefits such as access to premium markets or reduced market risk. Supplier net value had the most significant positive antecedent of relationship quality (0.46**). The positive influence of supplier net value on relationship quality is consistent with previous research which has shown that relationship benefits have a positive impact on relationship quality (Villena et al., 2011). Furthermore, Ulaga and Eggert (2006) also demonstrated a positive correlation between relationship value and relationship quality. In another study, Ravald and Grönroos (1996) suggested that the value of a relationship is based on the perceived benefits in relation to perceived costs. Ulaga and Eggert (2005) also demonstrated that the higher the net value expected or received then the stronger the motivation to continue the relationship. The link between social capital and performance is also identified in some studies, for example, Villena et al. (2011) identify the positive effects of social capital on performance. This body of research along with this current study supports the important role supplier net benefit has in improving relationship quality and supplier performance.

10.4.5 Supplier performance

Supplier performance was conceptualised in terms of supplier behaviours and outcomes that create value and competitive advantage for the processor (Dyer & Singh, 1998). A number of tangible and intangible performance criteria were identified from the literature and from interviews with key informants from the processors. In doing this, the concerns of Siguaw and Simpson (2004) were addressed. They criticise many programmes that assess supplier performance by only evaluating tangible aspects such as product quality.

Delivery quality and quantity

The delivery quality and quantity variables relate to the quality of stock and the quantity and timing of the product delivered to the processor. These variables are important to the processor as they directly affect product quality and delivery reliability. Though these variables were highly correlated (0.49***) they were identified as distinct constructs in the exploratory factor analysis. They also had quite different relationships with the antecedents of supplier performance. For example, relationship quality had no influence on delivery quality whereas it had a significant impact on delivery quantity. They were, however, similar in their direct effects. For both variables, it was the supplier characteristics had the greatest impact. The common direct effects were with self-direction, supplier motivation and ability. For both theses variables, self-direction had a negative impact. This implies that more independent suppliers were less focused on quality outcomes. Customer focus was important for delivery quality but had only weak indirect effects on delivery quantity. This suggests that suppliers who are customer focused concentrate on producing quality stock and do not see the timing of delivery as an important aspect of meeting customer requirements. This may be due to the seasonality of supply and the use of stock numbers to manage pasture.

The results relating to delivery quantity and quality suggest that processors who require higher quality stock delivered at specific times may need to choose suppliers based primarily on their supplier characteristics. These suppliers need to be high on ability and motivation and low on self-direction as these factors have the greatest impact on these quality variables and are unaffected by relationship quality. In addition to ability, motivation and self-direction there are other indirect factors that affect delivery quantity, but not delivery quality. The factors that affect delivery quantity through relationship quality are specific investments, net value, supplier dependence, processor dependence and power (Figure 9-3).

This finding suggests that relationship quality is more important for delivery quantity than quality. This may be because delivery of the required numbers of stock at specific times in a pastoral system is more complex than meeting quality specifications. Less flexible delivery schedules can directly affect profitability by increasing costs and effort. Relationship quality therefore becomes more important as suppliers need to trust that they will be sufficiently rewarded for meeting these delivery schedules. As a result, to improve the reliability of delivery, supplier selection must go hand in hand with building relationship quality. In contrast, the quality of the stock delivered is a result of specific supplier characteristics and is independent of relationship quality. Kannan and Tan (2002) indicate that it is easier to address supplier delivery problems if there is a good relationship between buyer and supplier. They also reinforce the need to see suppliers as an extension of the buying firm itself and not as individual entities. The importance of quality and delivery reliability for supplier performance is consistent with some empirical evidence. For example, Kannan and Tan (2002) state that while cost may be an important criteria for buyers outcomes such as quality, delivery and service are also important. Other research highlights the importance of not just focusing on these quality outcomes. This is clearly stated by Simpson, Siguaw, and Baker (2001) who argues that "Though a certain level of quality may be necessary to compete, quality in and of itself may not necessarily provide a competitive advantage in today's marketplace" (p.120).

Communication and loyalty

Supplier communication and supplier loyalty are two important intangible performance outcomes that directly relate to the nature of the relationship with the processor (Figure 9-4 and Figure 9-5). They are moderately correlated (0.37***), and the results showed that the direct and indirect effects captured a significant amount of the variance in these variables (R^2 - loyalty 0.48, R^2 - communication 0.32).

The importance of loyalty is highlighted by Palmatier et al. (2006) who emphasised that increased loyalty is one of the most common outcomes resulting from relationship management efforts. Supplier loyalty is also important for maintaining security of supply, reducing supplier acquisition costs and for processors to capture the benefits of supplier development efforts. Loyalty is influenced by direct and indirect effects from specific assets, supplier dependence, power and supplier net value. Of the other variables, only self-direction had a direct effect, whereas customer focus and processor dependence had only

indirect effects. Communication was affected by both direct and indirect effects involving supplier dependence, specific assets, supplier net value and customer focus. Supplier motivation had only a direct effect while power only effects communication when mediated by relationship quality. Most of the antecedents of communication and loyalty were relationship characteristics. This may suggest that the relationship attribites have a greater effect on the intangible variables involving human interaction. Relationship quality had a greater impact on loyalty (0.38***) than any other variable in the study. Supplier ability did not affect loyalty and communication, nor does supplier motivation affect loyalty, though it does have a direct effect on communication.

The complexity of these relationships explains why it can be difficult to develop a base of loyal suppliers with high levels of communication. For example, a self-directed supplier's loyalty is independent of relationship quality. In contrast, most of the other antecedents have some direct influence on loyalty and have an additional influence through relationship quality. Communication and information sharing is believed to be a critical factor for improving supply chain performance by facilitating planning, and scheduling. This reduces the need to carry inventory and improving the nature and speed of communication between supplier and buyers. The importance of communication and information sharing has been frequently emphasised for effective organisational relationships (Modi & Mabert, 2007; Mohr & Nevin, 1990; Monczka et al., 1998). The results of this study are consistent with previous research that show supplier's willingness to share information has a significant effect on the buyer firms performance (Hsu, Kannan, Keong Leong, & Tan, 2006; Kannan & Tan, 2002; Paulraj et al., 2008). Cousins and Menguc (2006) also argue that supply chain integration and stronger relationships lead to higher levels of communication as well as operational performance. Micheels and Gow (2011) emphasise the importance of communication for providing benefits to buyers by sharing production information which can decrease product variation and reduce sorting costs.

Supplier profitability

Supplier profitability is different to the other performance outcomes as it directly benefits the supplier as well as the processor. From the processor's perspective, they want profitable suppliers to ensure access to long term sustainable producers and therefore security of supply. For example, Cheraghi, Dadashzadeh, and Subramanian (2011) review the literature on supplier selection and conclude that "buyers and sellers are looking for partners that are

viable, ongoing concerns that will contribute to the relationship both for the present and in the future". It is of note that profitability is influenced by a number of supplier and relationship characteristics. This suggests that supplier profitability is affected by the relationship with the processor as well as a supplier's individual characteristics. It was also somewhat surprising that the results showed no significant effect of supplier ability on profitability (Figure 8-5), and there was a negative relationship with motivation. This implies that supplier ability and motivation does not necessarily result in improved profitability. Though this is a somewhat surprising result, this is consistent with other recent findings. For example, Elliott and Wakelin (2016) in their research on New Zealand sheep and beef farmers, found that the core drivers of top performing farmers were family and way of life. While profit was important to these farmers' financial performance, this was a means to provide opportunities to for their families and to live the farming way of life. Besides these two factors, there was a complex and diverse range of motivations that affected farmers' profitability. This is likely to affect the drivers of profitability where there may be top performing farmers may not be driven to maximise profitability but have other objectives and motivations.

Self-direction was the main supplier characteristic that had a positive effect on supplier profitability. This suggests that self-directed suppliers seek profitability over other outcomes such as communication, delivery quality and/or quantity. Supplier dependence also had a negative effect profitability, though it also had a positive indirect effect with the presence of relationship quality (Figure 8-8). The impact of relationship quality on supplier profitability is one of the significant findings of the research. Only with mediation by relationship quality, is supplier profitability positively affected by processor dependence, specific investments, customer focus, supplier dependence and supplier net value and negatively by power.

10.5 Summary

This discussion argued that in order to improve supplier performance, a holistic approach is needed that involves supplier characteristics, relationship attributes and relationship quality. This suggests that to improve supplier performance, processors not only need to select suppliers with high levels of ability, motivation and customer focus, but they also may need to avoid suppliers who are highly self-directed. Also, building closer relationships with their suppliers will further benefit the supplier's performance. They can also benefit from influencing relationship attributes. An important component of improving relationship

attributes is ensuring that suppliers experience positive value from the relationship. This involves reducing the costs and risks and maximising the benefits involved in supplying the processor. For example, this may involve providing suppliers access to premium markets, reduced production and market risk and providing access to new technologies (Table 4-1 and Table 4-2). The final aspects of relationship attributes are related to dependence, specific assets and power. Most importantly, buyers need to avoid the use of coercive power. The ability to use power is closely related to the supplier's investments in specific assets and their dependence. This suggests that processors may need to encourage suppliers to invest in specific assets, as these can have a considerable impact on loyalty and communication as well as lesser effects on reliable delivery and supplier profitability. Specific assets are also closely related to supplier dependence, which also has a considerable positive influence on communication and loyalty but has a negative effect on supplier profitability. Processors, therefore, need to manage supplier dependence to minimise the effect this has on profitability and avoid taking advantage of the opportunity to exercise coercive power. Finally, relationship quality is an important mediating variable between the supplier and relationship factors and supplier performance. This means that building strong relationships with suppliers will augment the direct effects on supplier performance. This is particularly important for the relationship attributes but also affected the supplier characteristics of customer focus.

10.6 Implications

This next section summarises the implications of the research results. It covers the contribution that this research makes to theory as well as considering the implication of the research for managers.

10.7 Theoretical implications

This study of relationship quality and supplier performance sits within the broader framework of buyer-seller exchange relationships. In this context, the research contributes to the literature on exchange relationships in several ways. Firstly, the study addressed some of the theoretical and conceptual challenges associated with exchange relationships that have been highlighted by recent authors (Hald et al., 2009; Halldorsson et al., 2007; Ireland & Webb, 2007; Leonidou et al., 2006; Ulaga & Eggert, 2005). These challenges refer to the broad range of definitions and theoretical concepts being applied to exchange relationships. The research addressed part of this by investigating how to better conceptualise the overall

strength and quality of buyer-seller relationships. The analysis involved combining constructs from social capital and relationship quality (see section 10.7.1 below).

Secondly, the research addressed how increasing the overall strength and quality of the buyer-seller relationship can improve supplier performance (see section 10.7.2 below). There is a significant amount of research that shows the multiple benefits of improving supplier relationships, for example, this is demonstrated by Benton and Maloni (2005), Cannon and Homburg (2001), Yeung et al. (2013), Cao and Zhang (2011) and Dyer (1997). However, the empirical findings of improving relationship quality are not always positive (Anderson & Jap, 2005; Villena et al., 2011; Yeung et al., 2013). This research contributes to the theoretical understanding of the positive and negative impact of relationship quality on specific supplier performance criteria.

Thirdly, the research contributes to a deeper understanding of how supplier characteristics and relationship attributes influence supplier performance (see sections 10.7.2, 0 and 0 below). This provides insight into the specific factors that affect supplier performance and has implications for a number of theories that relate to exchange relationships.

Fourthly, the research adds to an understanding of supply chain management theory by defining performance constructs that are relevant to suppliers and processors in the agri-food sector (see section 10.7.3 below). These were linked back to the supplier and relationship factors specifically relevant to this industry. Despite the importance of relationships quality in agri-food supply chains, there have been relatively few studies that have specifically addressed this issue. Fischer (2013), Schulze, Wocken, and Spiller (2006) and Schulze and Schlecht (2009) are some of the few authors to focus on this.

Finally, the research adds to the growing body of literature that draws on a broad range of managerial, economic and sociological theories to explain exchange relationships. The research identified and validated common constructs from multiple theories and applied these to the research model (see section 10.7.4).

10.7.1 Relationship quality and social capital

A significant focus of the research was evaluating the structure and measurement of the relationship quality construct. The study makes a specific theoretical contribution by providing evidence that social capital and relationship quality are in fact closely related concepts (Figure 7-2). This has direct implications for the theoretical understanding of both

relationship quality (Dwyer et al., 1987; Dyer & Singh, 1998; Lusch & Brown, 1996) and social capital theory (Granovetter, 1992; Krause et al., 2007; Nahapiet & Ghoshal, 1998; Villena et al., 2011). The research is important as there have been few published studies that have included both these concepts, with Chen, Tzeng, Ou, and Chang (2007) and Yli-Rnko, Autio and Sapienza being the exceptions.

The CFA demonstrated that the two constructs were highly correlated and did not meet the criteria for discriminant validity (Table 7-1). This result suggests that they are both measuring very similar concepts. The research also tested different models involving social capital and relationship quality (Figure 7-1, Figure 7-2, Figure 7-3 and Figure 7-4). These different models suggest that there are potentially multiple ways of structuring these constructs that are equally valid. The combined models enable a more comprehensive conceptualisation of relationship quality and social capital to be developed (Figure 7-3). This outcome has significant theoretical implications for future research on relationship quality and social capital. In particular, combining these two constructs enabled this research to incorporate a more comprehensive measurement of the "overall strength of a relationship" (Lages et al., 2005, p. 1041). This result was demonstrated by the fact that the sub-dimensions of relationship quality and social capital were in fact distinct constructs and achieved the required measures of discriminant validity. This outcome suggests that although social capital and relationship quality seem to be very similar concepts, the dimensions are clearly measuring different constructs. For example, relationship quality does not include the structure dimension of the relationship and social capital does not include satisfaction. Consequently, this implies that these constructs add to the measurement of the strength and quality of the relationship.

These findings also imply that the existing relationship quality and social capital constructs are an incomplete measurement of the overall strength and quality of the relationship. For example, social capital theory does not include the measurement of the satisfaction and commitment in the relationship. In a similar way, relationship quality omits the structural strength of the relationship in terms of frequency and depth and breadth of interaction (structural social capital). Relationship quality also does not specifically measure the cognitive aspects of common values and goals. Though both theories measure trust in the relationship, the relational aspect of social capital focuses more on two-way trust and mutual friendship. Future research should continue to explore the relationship between these two constructs. Rather than being viewed as competing theoretical constructs, the

potential exists to understand how these two constructs can be combined to give a more complete measure of the strength and quality of these relationships.

10.7.2 Understanding of antecedents of relationship quality and supplier performance

This study adds to the knowledge of the antecedents of supplier performance. While there is considerable body of research on relationship quality and aspects of performance, many of these studies measure relationship quality and then assume a performance benefit (Athanasopoulou, 2009; Kee-Hung et al., 2005; Petroni & Panciroli, 2002; Srinivasan et al., 2011; Wei, Wong, & Lai, 2012; Yan & Dooley, 2013). Other studies only focus on measuring the effect of relationship quality on a limited number of dimensions such as speed of product development or improved purchasing strategy (Crosby et al., 1990; Doney & Cannon, 1997; Hewett et al., 2002; Hunt & Davis, 2008). This study adds to the literature on supplier performance by analysing the effects on supplier performance of supplier characteristics and relationship attributes combined with the effects of mediation by relationship quality. The study builds on the theoretical framework proposed by Athanasopoulou (2009), (see Figure 3-1) which includes relationship attributes, relationship quality, buyer-supplier characteristics and performance. The research further developed this framework by defining the constructs that make up supplier characteristics and relationship attributes. Furthermore, this study was able to confirm some of the relationships in this theoretical framework. The research confirmed that the supplier characteristics, relationship attributes and relationship quality were all antecedents of supplier performance. While there has been considerable quantitative research that has evaluated a range of antecedents of relationship quality, there is little consensus on these. This research was able to contribute to the understanding of these antecedents of relationship quality (Table 10-3) by including a wide range of variables used in previous research (Crosby et al., 1990; Dwyer & Oh, 1987; Kumar et al., 1995; Leonidou et al., 2006; Morgan & Hunt, 1994; Ulaga & Eggert, 2006).

Table 10-3: Antecedents of relationship quality

Antecedents of relationship quality	Weight and significance
Supplier dependence	0.10***
Processor dependence	0.12***
Specific assets	0.27***
Power	-0.47***
Supplier net value	0.46***
Customer focus	0.19***

The effect of specific assets

The relationships between these variables added to several of the theories described in the literature review. For example, specific assets is an important concept in transaction costs economics (Coase, 1937; Williamson, 1979) the resource-based view (Barney, 1991; Poppo & Zenger, 1997; Wernerfelt, 1984) and the relational view (Dwyer et al., 1987; Dyer & Singh, 1998; Molina & Dyer, 1999; Morgan & Hunt, 1999). According to transaction cost economics investment in specific assets creates dependence and the potential for opportunistic behaviour which can include the use of coercive power. These relationships were confirmed by the high correlation between specific assets, supplier dependence and power. This suggests that suppliers who invest in specific assets become more dependent on their buyer and are therefore more vulnerable to buyers using coercive power (Ireland & Webb, 2007). This research confirms this view by showing that that a supplier's investment in specific assets benefits supplier performance, but only when mediated by relationship quality. For example, specific assets only improved supplier profitability when mediated by relationship quality. This relationship was also the case for reliable delivery (delivery quantity). Loyalty and supplier communication were partially mediated by relationship quality. This confirms that relationship quality can mitigate the risk of opportunistic behaviour associated with investments in specific assets and then produce benefits in terms of supplier performance. This contributes to the view of transaction cost economics where relational governance can be an effective way of mitigating the risk of opportunistic behaviour.

Supplier dependence

Supplier dependence is an important concept in resource dependence theory (Davis & Cobb, 2010; Emerson, 1962; Pfeffer & Salancik, 2003). The results show that dependence can actually lead to decreased supplier profitability. This suggests that buyers were taking advantage of the dependence of their suppliers. The study also showed that relationship quality mitigates these effects. This was because there was a positive relationship between dependence and profitability when mediated by relationship quality. This result supports the transaction cost perspective and resource dependence theory where trusting relationships, shared goals and values act as relational (hybrid) governance mechanisms that mitigate the risks of dependence (Casciaro & Piskorski, 2005; Ouchi, 1980; Williamson, 1979). The results

also contribute to the relational view and resource-based view whereby specific assets, in particular, human assets, are critical to a firm's performance.

This research supports the RBV literature by showing the value of the supplier's access to strategic resources. For example, supplier net value directly affected the supplier's profitability and other performance variables. This is a measure of a supplier's access to strategic resources and suggests that these can directly benefit both the supplier in terms of profitability as well as the processer in terms of improved supplier performance. The importance of suppliers experiencing positive net benefits (net value) from their relationship with the buyer was a significant finding of this study. This advances the work of Ulaga and Eggert (2006), who identify value as the trade-off between the benefits and costs of the relationship.

Relationship quality also played an important role in mediating these relationships indicating that relational resources are an important part of realising the benefits of access to strategic resources. A number of studies from the RBV perspective argue that inter-firm relationships of themselves are a valuable resource contributing to a firm's competitive advantage. For example, Martín-de-Castro, Delgado-Verde, López-Sáez, and Navas-López (2011) describe relational capital as the value to an organisation of the relationships it maintains with agents connected to it business. RBV research has not tended to explore the nature of these relational resources and how they provide value to suppliers and buyers. This research addresses this gap by providing a comprehensive model of these complex relational resources and their impact on supplier performance.

A further contribution to the RBV framework is that the supplier's characteristics can be viewed as valuable human resources that to some extent become available to the buyer through their relationship with their suppliers. However, the results showed that customer focus was the only supplier characteristic that was influenced by relationship quality with all the other supplier characteristics directly affecting supplier performance. This outcome is significant from a transaction cost and RBV perspective as it suggests the majority of human resources do not require the development of relational resources to utilise these characteristics. This is likely to be because supplier characteristics, such as ability and motivation, do not become specific assets as these characteristics can easily be transferred to other supply relationships. Therefore, these do not require the relational safeguards to mitigate against opportunistic behaviour. On the other hand, customer focus does create some level of specific assets as the supplier builds up knowledge of the specific requirements

of their customer. Therefore, this part of customer focus can be viewed as a specific asset. These results were consistent with transaction costs economics and the RBV. This shows that when suppliers develop characteristics that are specific assets they also look to developing stronger relationships to mitigate against the associated risk. In contrast, where specific supplier characteristics are not specific assets the supplier does not need to seek a closer relationship with their buyer. This is consistent with Williamson (1991) who states that increases in asset specificity are only justified if an increase in efficiency or revenue offset the added governance costs.

Consistent with this theory, the relationship attributes can be viewed as intangible relational resources that influence supplier performance. All these attributes are to some degree mediated by relationship quality. This result also supports the view that these relationship attributes are, to some degree, specific assets. As a result, relationship quality is required to fully realise the benefit of these relational resources or is necessary to mitigate against the risk of opportunistic behaviour. For example, supplier net value is a measure of the degree to which the supplier receives strategic non-economic benefits from the buyer. To ensure that these benefits are fully realised, and to mitigate against the potential loss of these benefits, the supplier will want to ensure they have a long-term quality relationship with their buyer.

Furthermore, the supplier will want to mitigate against the risk of the use of coercive power and therefore will work to build a strong relationship with their buyer. In this research, power was a significant relationship attribute that had a considerable negative effect on relationship quality as well as a direct negative effect on loyalty. Power is an important variable in a number of theoretical frameworks including resource dependency theory (Molm, 1997) and transaction cost economics (Ireland & Webb, 2007). This research validates these theories by identifying the negative role coercive power has on relationship quality and supplier performance (Ireland & Webb, 2007). The research has also shown the correlation of between specific assets, dependency and power. These results are consistent with resource dependence theory and transaction cost economics.

10.7.3 Agri-food supply chains

The research also contributed to supply chain theory by developing a greater understanding of buyer-seller relationships that are relevant to the agri-food sector. There has been little empirical research on supplier performance in agri-food supply chains. Hence this study addressed these issues by adapting established measures and where necessary developing

new measures of supplier performance with specific relevance to agri-food supply chains. This process addressed some of the attributes of agri-food supply chains that are different to manufacturing supply chains. For example, a significant difference in agri-food supply chains is the large number of individual suppliers all supplying the same commodity to the buyer. As a result, the supplier relationships are with a large pool of suppliers who produce the same undifferentiated product. The supplier characteristics of ability, motivation, self-direction and customer focus are the attributes of individuals rather than a firm. Research has shown people make different judgements when evaluating an individual rather than a group (Hamilton & Sherman, 1996; Palmatier et al., 2006). This adds to the supply chain literature and the RBV by identifying the human resources of individual farmer suppliers and the way these effect relationship quality and supplier performance.

In addition, some of the supplier performance criteria are specifically related to agri-food supply chains. For example, two quality criteria were adapted for this context. These related to the unique characteristics of the production of red meat products. For example, quality generally relates to producing animals of a specific size and fat composition as well as less tangible criteria such as animal welfare and environmental stewardship. Achieving these specifications requires suppliers with high levels of ability and motivation. Delivery quantity involves delivering the numbers of stock when required. This had a similar relationship to supplier ability and motivation, however, was also influenced by relationship quality. The influence of relationship quality on delivery quantity may be due to production factors. Delivering the number of stock required is especially difficult because of the seasonal nature of production in a pasture based system. There is a peak of production in summer and autumn and low levels of output in winter and early spring. Often processors prefer stock delivered out of season to meet customer requirements for a year-round global supply. These requirements can involve significant extra costs to suppliers as they need to supply additional feed and management resources, thus creating a risk that they will not be sufficiently compensated for this. Accordingly, suppliers need to pursue closer relationships with their buyers to mitigate against this risk. These factors highlight some of the specific differences to manufacturing supply chains which have significantly more control over the quality of inputs and outputs. This research contributes to supply chain theory, as even though some of the performance criteria were specifically adapted to red meat supply chains, many of the relationships were consistent with existing theoretical frameworks such as the resource-based view, transaction cost economics and resource dependence theory.

Although these supply chains have distinct characteristics, these theoretical frameworks still apply.

10.7.4 Common concepts from different theoretical frameworks

Finally, the study contributed to a growing body of research that identifies a significant overlap between the economic, managerial and sociological theories relating to exchange relationships (Halldorsson et al., 2007; Ulaga & Eggert, 2005; Wulf & Odekerken-Schröder, 2001). Despite the apparent differences of these theories, they in fact have many similarities and share a number of common constructs (Table 2-12). This finding supports the multi-paradigm and multi-theory approach to the supply chain research (Gioia & Pitre, 1990). There is a significant amount of empirical research that has taken a multi-theoretical approach to buyer-seller relationships, for example Ireland and Webb (2007). However, there is a dearth of studies that have attempted a comprehensive synthesis covering the economic, managerial and sociological perspectives. This study furthers previous studies that are use multiple theories to address the issues of relationship quality and supplier performance (Ireland & Webb, 2007). The development and validation of common constructs significantly adds to the theory of exchange relationships by identifying a common basis for exploring factors that affect exchange relationships.

10.8 Summary

This research makes a significant theoretical contribution by providing evidence that social capital and relationship quality are in fact closely related concepts. Combining these two constructs enabled a more complete measurement of the overall strength of a relationship. Therefore, rather than viewing these as competing theoretical constructs, there is the potential to understand how these two constructs can be combined to give a more complete measure of the strength and quality of these relationships.

This study also adds to the understanding of the antecedents of relationship quality and supplier performance. The research also showed significant effects of relationship attributes on relationship quality. Moreover, this study demonstrates the positive effect of relationship quality on supplier performance. Also, this research has also identified the direct effects of the supplier characteristics as well relationship attributes of on supplier performance. It has shown that these effects were consistent with a number of theoretical frameworks. In particular, it showed the impact of specific assets, dependence, power and net value on

supplier performance and the role of relationship quality in mitigating the risk of the adverse effects of these factors.

The research also contributed to an understanding of buyer-seller relationships by defining performance constructs that were relevant to processors in the agri-food sector. The research demonstrated that although red meat supply chains have may distinct characteristics the accepted theoretical frameworks still applied.

Finally, the study contributes to a growing body of research that identifies a significant overlap between the economic, managerial and sociological theories relating to exchange relationships. The identification and validation of common constructs significantly adds to the theory of exchange relationships by identifying a common basis for exploring factors that affect buyer-supplier relationships.

10.9 Managerial implications

This study set out to address challenges faced by managers who are attempting to build closer relationships with their suppliers and improve their performance (see section 1.1). The research showed that relationships between buyers and suppliers and the performance of these suppliers is a critical component of supply chain performance and a firm's competitive advantage (Tracey & Vonderembse, 2000; Ulaga & Eggert, 2006).

This study provides managers with an understanding of how to improve the quality of relationships with, and the performance of, their suppliers. In doing this, it provides buyers with an understanding of where to focus their efforts in supplier selection and how to manage these relationships. This research was novel in identifying supplier characteristics, and relationship attributes, that affect relationship quality and subsequently supplier performance (Figure 1-4). This provides managers with a greater understanding of how to influence supplier performance and improve their competitive advantage.

10.9.1 Relationship quality and supplier performance

One of the aims of this research was to show how improving relationship quality, supplier characteristics and relationship attributes affect supplier performance. Many buyers wish to develop closer relationships with their suppliers to improve supplier performance. Though the motivation for this may often be based on self-interest rather than a desire to benefit the supplier. These assertions imply that they take a calculative approach to these relationships and seek to maximise the benefits of the relationship, whilst minimising the costs and risks. However, in achieving this, they do not necessarily know how best to invest

in building relationships with their suppliers, or how this will affect supplier performance. This uncertainty means it is difficult to know what their return on investment will be from developing closer relationships with suppliers. In particular, they may be unsure as to where to focus their efforts and what characteristics to look for in selecting suppliers who will best respond to relationship development (Cox, 2001). By addressing these issues, this research contains some important implications for managers. It provides them with an understanding of the role of relationship quality in improving the performance of their suppliers. The research also shows how relationship attributes and supplier characteristics can affect both relationship quality and supplier performance.

This research also identifies the complex interactions between the supplier and relationship variables, and their impact on relationship quality and supplier performance. This complexity makes managing supplier relationships and performance challenging as no simple pattern emerges in the relationships between these variables. The benefits of understanding these complex relationships have been noted by Morgan and Hunt (1999) and Hunt and Davis (2008). They claim that it is this complexity and casual ambiguity in buyer-supplier relationships that make them hard to copy and therefore can provide firms with a sustainable competitive advantage. This research has measured and explained, in part, some of this ambiguity and will hopefully make the manager's job somewhat clearer.

In addition, this research highlights that relationship quality plays a major role in improving the performance of suppliers. The research went further by identifying factors that influence relationship quality. Most of these antecedents were relationship attributes including, supplier dependence, specific assets, power and supplier net value. Customer value was the only supplier characteristic that influenced relationship quality. Supplier net value and use of power had the greatest impact on relationship quality. Supplier net value measures the strategic non-financial benefits suppliers receive (Villena et al., 2011). This indicates that suppliers may enter into long term relationships for non-financial benefits such as access to premium markets, reduced market risk and access to new technology (Table 4-1 and Table 4-2). This supports the long-term view that suppliers are not necessarily just seeking a short term economic return but are also motivated to seek long term strategic benefits. These may involve developing their farm business, but also may mean meeting stakeholder demands to be a responsible social actor and develop long term relationships with their buyer. The implication for managers is that developing strategic non-economic benefits for

suppliers is an important part of building relationship quality. Without these benefits, long-term partnerships and the subsequent impacts of relationship quality on supplier performance are unlikely to be achieved.

Power was the only relationship attribute that had a negative effect on relationship quality and supplier performance. This is consistent with a significant amount of existing research that shows the use of coercive power having a considerable negative effect on relationship quality and performance (Maloni & Benton, 2000; Molm, 1997; Yeung, Selen, Zhang, & Huo, 2009; Zhao et al., 2008). This consistent negative effect clearly shows that improving supplier relationships and performance requires actors to avoid the use of coercive power. While specific assets and supplier dependence can provide buyers with the opportunity to exercise coercive power, the result will be a decrease in the quality of the supplier relationships consequently supplier performance.

The study was also distinctive in that it took into consideration specific supplier characteristics as well as attributes of the relationship and measured the effect of these variables on relationship quality and supplier performance. The study showed that there were considerable differences in the effects of the supplier characteristics compared to the relationship attributes. Supplier characteristics mostly had no effect on relationship quality except for customer focus. This outcome was a significant finding as it highlights that there are few supplier attributes that improve relationship quality. This result indicates the difficulty buyers have in selecting suppliers with characteristics that will positively influence the quality of their relationship. Buyers may want to identify and attract high performing suppliers who have the potential to form long-term quality relationships. This would enable them to maximise the return from their investment from developing a closer relationship with their suppliers. This research shows that it is difficult to identify these suppliers other than those who are customer focused. These customer focused suppliers look to meet the requirements of their immediate buyer in the supply chain, and also the end consumer. Suppliers with a focus on customers are likely to want a closer relationship with the buyer, so they can adapt their production to better meet customer requirements. This was supported by the positive relationship between customer focus and delivery quality. Though most of the supplier characteristics did not affect relationship quality, they did have important direct effects on supplier performance. This finding means they had an effect on supplier performance independent of relationship quality. Consequently, to improve the

quality of the relationships with their suppliers, managers need to develop interdependent relationships, ensure suppliers experience positive net benefits from the relationship, encourage supplier to invest in specific assets and avoid the use of power.

10.9.2 Supplier performance

This research has direct managerial implications for processors who want to improve supplier performance and consequently improve their competitive advantage. The research addressed the question of how processors can influence supplier performance, as improving supplier performance is an important goal for many buyers. A supply base with higher performing suppliers can provide buying firms with a competitive advantage. The specific performance aspects are discussed in the following sections.

10.9.3 Quality

Product quality is an important supplier performance goal for buyers (Siguaw & Simpson, 2004). This requires meeting the buyer's requirements for quality and delivery. These are important to buyers as improved quality and reliable delivery can have a direct impact on their ability to meet their own customers' requirements. These two quality variables had some significant differences in their antecedents. The research showed that meeting buyer quality specifications were affected only by supplier characteristics. This finding implies that supplier selection is an important strategy for improving quality. In contrast, delivery quantity was influenced by relationship quality as well as supplier characteristics. The implication for managers of these results is that reliable delivery requires investment in relationship quality as well as selecting suppliers with ability and motivation. On the other hand, meeting quality specifications is not influenced by relationship quality. This means that improving product quality requires selecting suppliers with ability, motivation and customer focus.

10.9.4 Loyalty and communication

Loyalty and communication are two supplier performance variables that have significant implications for managers. This is because these variables can directly affect the buying firm's profitability and competitive advantage (Ahmad & Buttle, 2001). Therefore, understanding the variables that influence loyalty and communication is an important objective for firms who wish to improve these two aspects of supplier performance. Loyalty and communication were influenced by a considerable number of variables involving supplier characteristics, relationship attributes and relationship quality (Figure 9-4 and

Figure 9-5). Relationship quality had a strong positive impact on loyalty and communication. This means to have suppliers who are loyal and are willing to share information requires managers to make an effort to improve the quality of their relationship with their suppliers. Relationship quality also mediates a large number of effects on loyalty and communication. These included supplier dependence, processor dependence, specific assets, supplier net value and power.

As well as the mediated effects, there are a number of direct effects on loyalty and communication. Most of these were relationship attributes except self-direction. This is both directly as well as through the mediated effect of relationship quality. Therefore, improving loyalty and communication requires attracting and developing self-directed and customer focused suppliers in addition to developing quality relationships with these suppliers.

Though there are significant differences in the relationship between the antecedents, some common conclusions can be drawn. For example, both loyalty and communication are influenced by the quality of the relationship with their suppliers, and this in turn is affected by relationship attributes. Furthermore, there are some common direct effects including relationship attributes (supplier dependence, specific assets and net value), and supplier characteristics (supplier motivation and customer focus).

10.9.5 Supplier profitability

Improving supplier profitability is important for buyers. After having invested in developing long term relationships with their suppliers, they also want them to be economically viable to ensure security of supply. Profitability is also of paramount importance to suppliers as they also want to maintain their economic viability. The profitability construct displayed a complex set of relationships with the supplier characteristics and relationship attributes. It showed that relationship quality had a significant mediating role within these relationships (Figure 9-6). This suggests that suppliers who develop closer relationships with their processor are more likely to experience improved profitability. The reason for this seems to be that a closer relationship with their processor mitigates some of the risk of investing in specific assets and becoming more dependent, hence, both of which can increase profitability.

Profitability was affected both directly and indirectly by supplier net value. This indicates that suppliers who have closer relationships with their processor may receive non-financial benefits such as access to premium markets or opportunities for higher value supply

contracts. From a managerial perspective, it is important to ensure that suppliers who develop closer relationships also receive both financial and non-financial benefits from the relationship.

As predicted, suppliers who are dependent on their processor had a negative effect on profitability. This suggests that buyers may be taking advantage of supplier dependence to reduce the price paid to suppliers therefore also exercising coercive power (Cox, 2001). This negative relationship with dependence changed to a positive effect when mediated through relationship quality. This result indicates that suppliers with a closer relationship with their buyer were not taken advantage of, and in fact, benefited from the dependent relationship. This has important implications for suppliers as it shows that relationship quality mitigates against the risk of opportunism that arises from dependence on the processor.

10.9.6 Summary

This study provides managers with an understanding of how to improve the quality of their relationships and the performance of their suppliers. In doing this, it offers buyers an understanding of where to focus their efforts in supplier selection and how to manage these relationships (Wilson, 1995). This research confirmed that relationship quality does play an important role in improving supplier performance. Therefore, managers who wish to improve the performance of their suppliers need to also focus on the quality of these relationships.

The research went further by identifying factors that influence relationship quality. Most of these variables were relationship attributes. Therefore, to improve relationship quality they need to be aware of the attributes of their relationship and how they can improve these variables. These actions include improving the non-economic value that suppliers receive. This can include increasing the benefits such as access to new technology or to premium markets. as well as reducing the costs and risks of the supply relationship. They also need to avoid the use of coercive power to manage suppliers. They need to work to develop interdependent relationships and encourage suppliers to invest in specific assets.

Processors also need to understand the supplier characteristics and the direct effects they have on the supplier performance and use these as supplier selection criteria. The research therefore provides managers with information on how to identify and attract suppliers who will meet the buyer's performance requirements. Furthermore, it identifies relationship

attributes that can enable processors to improve the quality of their relationships as well as directly improving supplier performance.

10.10 Limitations

Although this study presents some important findings and contributions, there are some limitations which open up avenues for future research. Firstly, given that relationships are dependent upon cultural context (Putnam, 1993; Villena et al., 2011) the research may not be generalisable beyond the New Zealand Meat Industry sample frame. Different contexts can result in significant differences in the nature of the relationship between buyer and supplier, in particular where the product is less consistent and more perishable (Zeithaml, Berry, & Parasuraman, 1996). It would be valuable to repeat the research in other cultural contexts, industries and with different products. It would be especially interesting to see if the research produced consistent results in a manufacturing industry context and therefore generalizable to other supply chains.

A second limitation is that the sample was mostly made up of individuals who were owner/managers, rather than being part of larger more complex organisations. For example, Palmatier et al. (2006) demonstrates that relationships have a greater impact on factors such as loyalty when the target of the relationship is an individual person. Other research shows that when people evaluate another individual, they make stronger, quicker, and more confident judgments than when they evaluate a group. These judgments are also more strongly related to outcomes and behaviours (Hamilton & Sherman, 1996; Palmatier et al., 2006). Given this, it would be worthwhile to see if the results could be replicated where the suppliers were larger companies with multiple individuals interacting with the buyer. Thirdly, the research surveyed only one side of the supplier-processor dyad. Because the data was only collected from suppliers it did not capture the processors' view of the relationship. Furthermore, the supplier performance and relationship quality variables were self-reported judgements from the supplier's perspective. The processor may have had a different perspective on the suppliers' performance and other variables. Also, the research looked at only one network connection, it did not take into account that the suppliers and processors are connected into wider network of relationships (Choi & Kim, 2008; Villena et al., 2011). The nature of these networks may affect the performance of the supplier (Rowley, Behrens, & Krackhardt, 2000). Fourthly, due to the cross-sectional nature of the data, it is not possible to draw definite causal interpretations from the data. Longitudinal data would be necessary to overcome some of these problems. A longitudinal data set with matched samples would

allow more deductions on changes over time and identify trends. This however was not the objective of this research. Finally, SEM has some limitations in terms of methodology. SEM requires *a priory* assumptions as to which variables affect other variables and the direction of these (Kline, 2005). Though these assumptions should be based on theory, there is often not sufficient accepted theory to clearly determine these relationships. This research, where possible, used existing theory to define the causal relationships, yet there were some situations where this was not possible and it was necessary to make a "best attempt" at relationships between variables.

10.11 Directions for future research

This study provides a good platform for future research. The study did not focus on supplier development despite there being a significant amount of literature on this (Hahn, Watts, & Kim, 1990). Future research could focus on identifying supplier development strategies that might affect the independent variables. For example, how do processors develop greater customer focus among suppliers? It would also be useful to validate the model of supplier performance in other agri-food sectors such as dairy or horticulture, as well as different cultural and geographical environments. The model could also be adapted and tested in non-agricultural industries. Confirming the results in other contexts would enable differences between industries to be identified and the validity of the model to be tested. As the study only surveyed suppliers it was not possible to make empirical conclusions from the buyer's perspective. For example, surveying buyers may be able to identify which of the supplier performance criteria were most important from the buyer's perspective. Future work could also be done to identify how processors can identify and select suppliers that will have higher performance and develop tools to identify these suppliers. Also, how they can identify poor performing suppliers? Furthermore, processors need to know if they should end their supply relationship with these suppliers or whether there are methods to improve their performance. This study identified the close association between social capital and relationship quality. This has important theoretical implications; more work needs to be done to evaluate these two constructs and provide understanding of the similarities and differences of these constructs.

10.12 Final comment

This study was able to clarify some of the conceptual challenges associated with exchange relationships. This was achieved by improving the way relationship quality is conceptualised and how it is related to social capital. This has filled a significant gap in the study of these two variables and provides an improved measure of the overall strength of the buyer-supplier relationship.

Furthermore, this research identified some of the relational resources that contribute to supplier performance. Specifically, the study identified the supplier characteristics and relationship attributes that drive supplier performance. The research also, identified the significant role that relationship quality plays in improving performance. The importance of these findings is well recognised but not elaborated on in the literature on buyer-seller relationships. For example, Lambert (2006) has argued that the ultimate success of an individual business is its ability to manage and integrate the company's complex network of relationships. This research contributes to the theoretical understanding of buyer-seller relationships, as well as providing managers with an increased understanding of how to manage relationships with their suppliers.

Appendix A - Representativeness and test for non-Response bias

Table A: 1 Response rate to first survey mail out

	Follow up survey	Follow up (surveys)			Follow up (respond rates) %		
		Complete	Incomplete	Total	Complete	Incomplete	Total
Deer	**611**	50	49	99	8%	8%	16%
Beef	**1416**	73	54	127	5%	4%	9%
Sheep & Beef	**2693**	184	127	311	7%	5%	12%
Total	**4720**	**307**	**230**	**537**	7%	5%	11%

Table A: 2 Total sample size for first time and follow up survey

Farm type	Sent first time	Follow up	Total
Deer	833	611	**1444**
Beef	1707	1416	**3123**
Sheep & Beef	3404	2693	**6097**
Total	**5944**	**4720**	**10664**

Table A: 3 Response rate for different farm types

	Total Surveys Completed	Total Response rate %
Deer	242	29%
Beef	233	14%
Sheep & Beef	730	21%
Total	**1205**	**20%**

Table A: 4 Regional response rate compared to Agribase

Region	Agribase %	Survey Responses %	Difference
Auckland	8.5%	1.8%	6.7%
Bay of Plenty	3.4%	3.2%	0.2%
Canterbury	18.8%	16.2%	2.6%
Gisborne	3.9%	3.9%	0.0%
Hawke's Bay	7.4%	10.4%	-3.0%
Nelson-Marlborough	4.8%	5.4%	-0.6%
Northland	5.6%	4.3%	1.3%
Otago	8.60%	13.60%	-5.00%
Southland	10.80%	13.80%	-3.00%
Taranaki	3.20%	1.40%	1.80%
Waikato	9.50%	10.10%	-0.60%
Wanganui-Manawatu	10.40%	12.20%	-1.80%
Wellington	3.80%	3.40%	0.40%
West Coast	1.30%	0.30%	1.00%

Table A: 5 Distribution of farms by size and type

Farms by size (ha) of farm and farm type (ANZSIC06) At 30 June 2012. Percentage in each category											
Farm size (ha) (ANZSIC06)	**60–79**	**80–99**	**100–199**	**200–399**	**400–599**	**600–799**	**800–999**	**1,000–1,999**	**2,000–3,999**	**4,000 and over**	**Total**
A0141 Sheep farming (specialised) (%)	4%	5%	17%	31%	14%	8%	5%	8%	5%	3%	100%
A0142 Beef farming (specialised) (%)	16%	13%	34%	22%	7%	3%	2%	3%	0%	0%	100%
A0144 Sheep-beef farming (%)	3%	3%	14%	24%	17%	10%	7%	14%	5%	3%	100%
A0180 Deer farming (%)	13%	11%	32%	25%	7%	4%	2%	3%	4%	1%	100%
TOTAL New Zealand (%)	8%	7%	22%	26%	13%	7%	4%	8%	4%	2%	100%
Farm types are classified by the Australian and New Zealand Standard Industrial Classification 2006 ANZSIC06).											
Source (Statistics New Zealand, 2013)											

Table A: 6 Comparison of farm sample farm size with 2012 agricultural census for specialised sheep farms and sheep and beef farms

Farm Size Class (Ha)	Agricultural Census 2012 (%)	Sheep Survey Responses (%)	Difference (%)
10–19			
20–39		0%	0%
40–59		1%	1%
60–79	4%	2%	-2%
80–99	4%	4%	-1%
100–199	16%	13%	-3%
200–399	28%	32%	4%
400–599	15%	16%	1%
600–799	9%	8%	0%
800–999	6%	5%	-1%
1,000–1,999	11%	12%	1%
2,000–3,999	5%	4%	-1%
4,000 and over	3%	3%	0%

Table A: 7 Comparison of farm sample farm size with 2012 agricultural census for specialised beef farms.

Farm Size Class (Ha)	Agricultural Census 2012 (%)	Beef Survey Responses (%)	Difference (%)
10–19		1.4	
20–39		0	0%
40–59		3%	3%
60–79	16%	8%	-7%
80–99	13%	6%	-7%
100–199	34%	24%	-10%
200–399	22%	28%	6%
400–599	7%	9%	2%
600–799	3%	5%	2%
800–999	2%	3%	2%
1,000–1,999	3%	10%	7%
2,000–3,999	0%	1%	1%
4,000 and over	0%	2%	2%

Table A: 8 Comparison of farm sample farm size with 2012 agricultural census for specialised deer farms

Farm Size Class (Ha)	Agricultural Census 2012 (%)	Deer Survey Responses (%)	Difference (%)
10–19			
20–39		1%	1%
40–59		1%	1%
60–79	13%	9%	-4%
80–99	11%	8%	-2%
100–199	32%	26%	-5%
200–399	25%	32%	7%
400–599	7%	8%	1%
600–799	4%	6%	2%
800–999	2%	3%	1%
1,000–1,999	3%	4%	1%
2,000–3,999	4%	2%	-2%
	1%	1%	0%

Table A: 9 Distribution of farms by region and type : Source (Statistics New Zealand, 2013)

Region	Total number of Sheep-beef-deer farms	% Sheep farming (specialised)	% Beef cattle farming (specialised)	% Sheep-beef cattle farming	% Deer farming (specialised)	Total % sheep-beef-deer farms
Northland	2,238	1%	16%	5%	1%	9%
Auckland	1,545	2%	10%	4%	4%	6%
Waikato	3,570	4%	21%	14%	8%	14%
Bay of Plenty	1,113	1%	7%	3%	6%	4%
Gisborne	564	1%	1%	6%	2%	2%
Hawke's Bay	1,728	5%	5%	13%	6%	7%
Taranaki	1,017	1%	6%	4%	1%	4%
Manawatu-Wanganui	3,252	15%	8%	19%	10%	13%
Wellington	1,026	5%	3%	5%	4%	4%
TOTAL North Island	**16,050**	**36%**	**77%**	**73%**	**42%**	**62%**
Nelson-Marlborough	1,023	5%	4%	4%	4%	4%
West Coast	258	0%	1%	1%	2%	1%
Canterbury	4,128	22%	13%	13%	27%	16%
Otago	2,109	17%	3%	6%	10%	8%
Southland	2,157	19%	2%	4%	15%	8%
TOTAL South Island	**9,711**	**64%**	**23%**	**27%**	**58%**	**38%**
TOTAL New Zealand	**25,773**	**100%**	**100%**	**100%**	**100%**	**100%**

Table A: 10 : Comparison of sample farm location with 2012 agricultural census for specialised sheep farms and combined sheep and beef farms

Sheep farms (specialised) and sheep and beef farms			
Region	**Agricultural Census 2012 (%)**	**Survey Responses (%)**	**Difference (%)**
Northland	3%	1%	-1%
Auckland	3%	1%	-2%
Waikato	8%	7%	-1%
Bay of Plenty	2%	3%	1%
Gisborne	3%	4%	1%
Hawke's Bay	9%	11%	3%
Taranaki	2%	1%	-1%
Manawatu-Wanganui	17%	13%	-4%
Wellington	5%	4%	-1%
Nelson-Marlborough	4%	6%	1%
West Coast	0%	0%	0%
Canterbury	18%	16%	-2%
Otago	13%	16%	3%
Southland	13%	17%	4%

Table A: 11 Comparison of sample farm location with 2012 agricultural census for specialised beef cattle farms

Beef cattle farming (specialised)			
Region	**Agricultural Census 2012 (%)**	**Survey Responses (%)**	**Difference (%)**
Northland	16%	15.6%	0%
Auckland	10%	7.1%	-3%
Waikato	21%	24.7%	4%
Bay of Plenty	7%	5.8%	-1%
Gisborne	1%	1.3%	0%
Hawke's Bay	5%	9.1%	4%
Taranaki	6%	2.6%	-4%
Manawatu-Wanganui	8%	14.9%	6%
Wellington	3%	1.3%	-1%
Nelson-Marlborough	4%	5.8%	2%
West Coast	1%	0.0%	-1%
Canterbury	13%	9.7%	-3%
Otago	3%	1.3%	-2%
Southland	2%	0.6%	-2%

Table A: 12 Comparison of sample farm location with 2012 agricultural census for specialised deer farms

Deer farming (specialised)			
Region	**Agricultural Census 2012 (%)**	**Survey Responses (%)**	**Difference (%)**
Northland	1%	1%	0%
Auckland	4%	2%	-2%
Waikato	8%	6%	-2%
Bay of Plenty	6%	4%	-3%
Gisborne	2%	3%	1%
Hawke's Bay	6%	8%	2%
Taranaki	1%	0%	-1%
Manawatu-Wanganui	10%	9%	-1%
Wellington	4%	2%	-2%
Nelson-Marlborough	4%	5%	1%
West Coast	2%	1%	-2%
Canterbury	27%	25%	-2%
Otago	10%	19%	9%
Southland	15%	15%	0%

Table A: 13 Comparison of survey sample with EU sheep meat quota allocation

Company	**EU Sheep Quota Allocation (tonnes)**	**% Quota**	**% Survey**	**Difference (%)**
Alliance Group	65,845	29%	27%	-1%
Silver Fern Farms	53,309	23%	28%	5%
AFFCO	28,109	12%	15%	3%
ANZCO Foods (CMP)	20,442	9%	8%	-1%
Ovation	14,635	6%	5%	-1%
Taylor Preston	12,417	5%	4%	-2%
Blue Sky Meats	6,727	3%	3%	0%
Lean Meats	5,733	3%	1%	-1%
Crusader Meats	4,944	2%	2%	-1%
Wilson Hellaby (Auckland MP)	4,786	2%	1%	-1%
Other	4,726	2%	4%	2%
Te Kuiti Meat Processors	3,882	2%	2%	0%
Prime Range Meats	2,360	1%		-1%
Total Quota Allocation	227,914	100%	100%	

(Source NZ Meat Board)

Table A: 14 : Comparison of survey sample with USA beef quota allocation

Company	USA Beef Quota Allocation (tonnes)	% Quota	% Survey	Difference
Silver Fern Farms	63,450	30%	21%	-8%
ANZCO Foods (CMP,Riverlands)	42,095	20%	16%	-4%
AFFCO	37,097	17%	21%	4%
Alliance Group	18,535	9%	6%	-3%
Greenlea	17,896	8%	11%	3%
Wilson Hellaby (Auckland MP)	15,948	7%	10%	2%
UBP Limited	10,720	5%	5%	0%
Taylor Preston	5,224	2%	2%	0%
Other	2,432	1%	4%	3%
Local Trade			2%	2%
Total	213,397	100%	100%	

(Source NZ Meat Board)

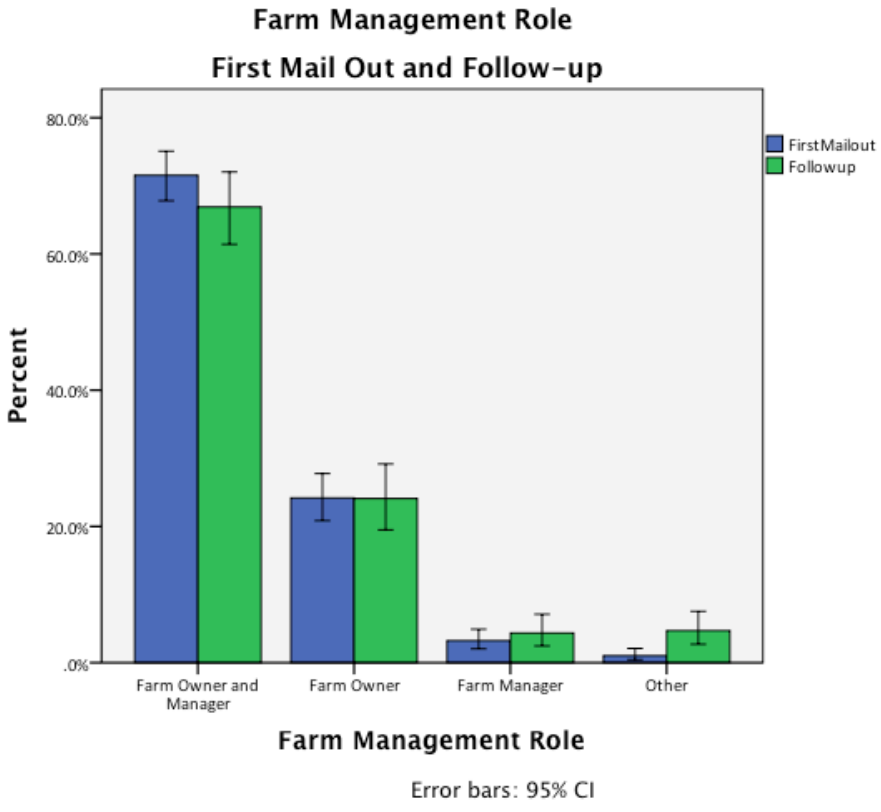

Figure A. 1 :Test for non-response bias – farm management role[36]

[36] Farm management role specifies the type of ownership and management role.

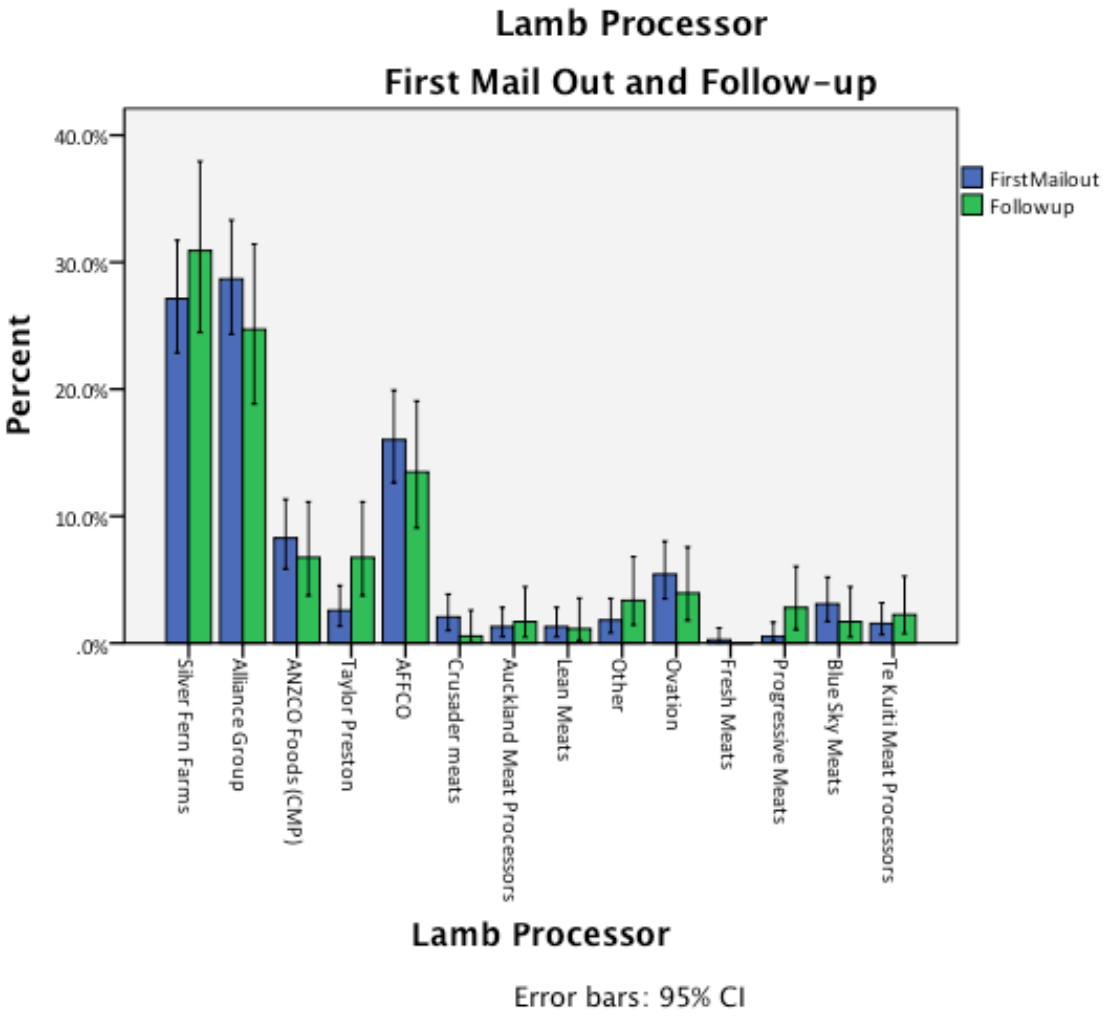

Figure A. 2: Test for non-response bias – processor

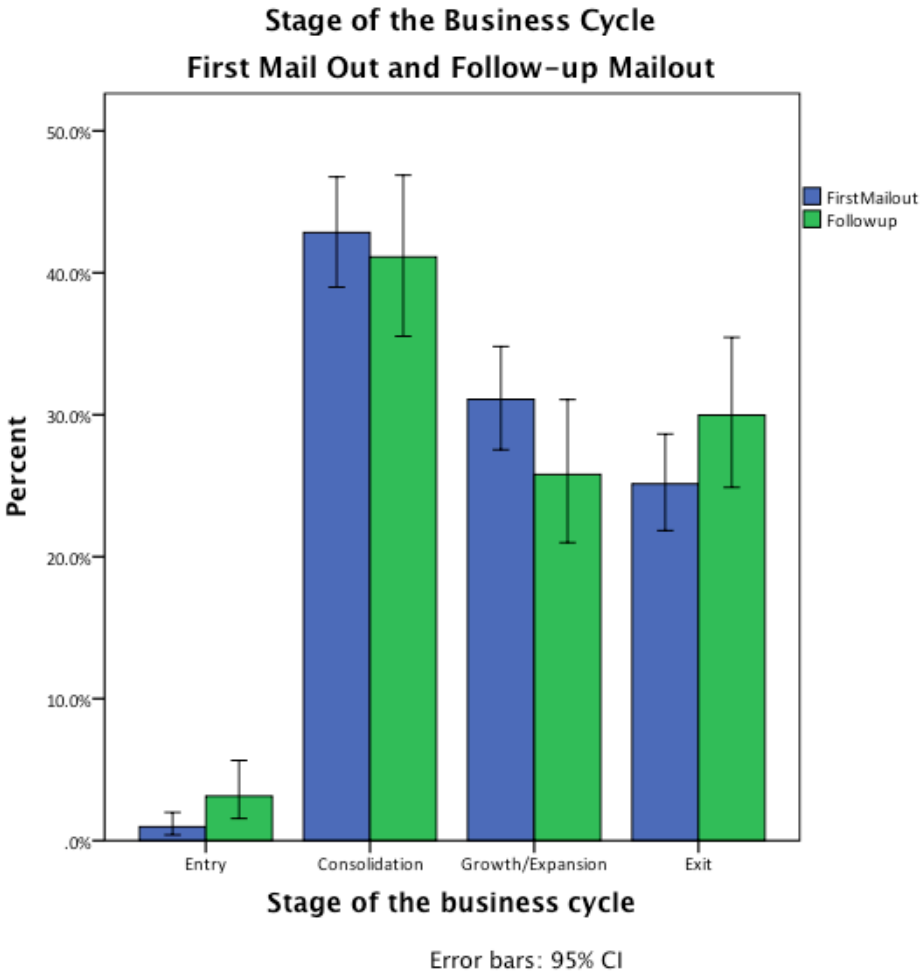

Figure A. 3: Test for non-response bias – stage of the business cycle

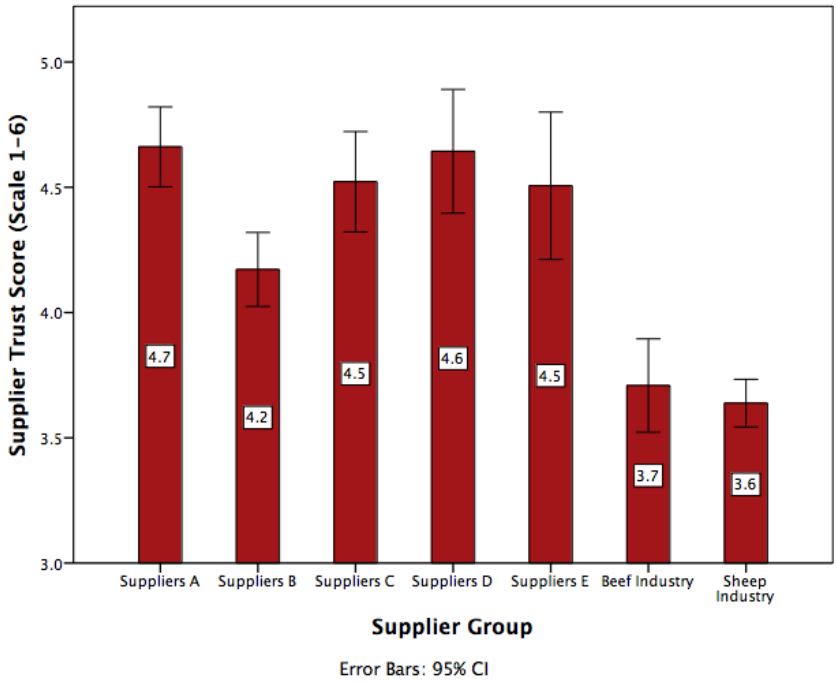

Figure A. 4: Comparison of trust for different supplier groups in the sheep and beef industry

(Scale ranged from 1 = low trust to 5 high trust)

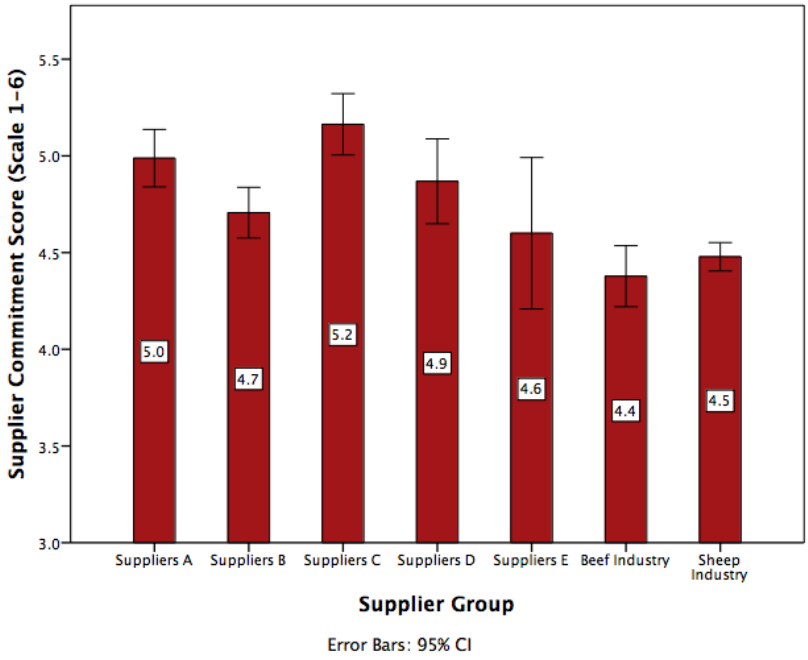

Figure A. 5: Comparison of commitment for different supplier groups in the sheep and beef industry

Scale ranged from 1 = low commitment to 5 = high commitment

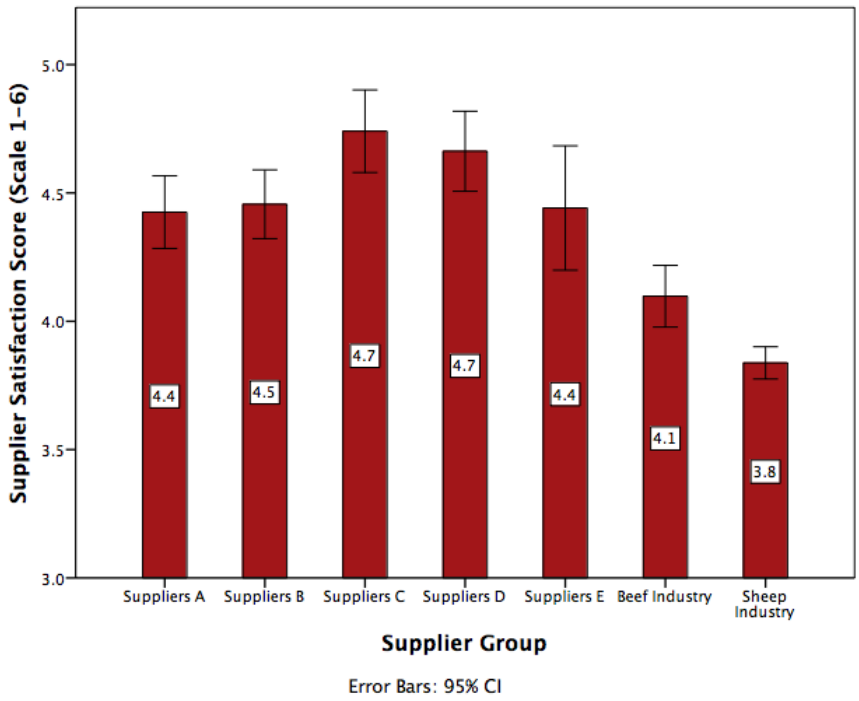

Figure A. 6: Comparison of satisfaction for different supplier groups in the sheep and beef industry

Scale ranged from 1 = low satisfaction to 5 = high satisfaction

Appendix B - Exploratory factor analysis

Table B: 1 Communalities for relationship items

Item	Initial	Extraction
ProcAbi1_Mktg	1	0.75
ProcAbil2_SChain	1	0.75
ProcAbil3_Prem	1	0.78
CommitL1_OptRev	1	0.56
CommitL3_PriceRev	1	0.67
CommitL4_SpotMktR	1	0.56
Commit_L5_SuplOne	1	0.62
Commit2_Resource	1	0.50
SuppCost2_Flex	1	0.67
SuppCost3_Incr	1	0.79
SuppCost4_Stress	1	0.75
SuppCost7_ProdRisk	1	0.81
SuppCost5_LessProfit	1	0.78
SuppCost6_MktRisk	1	0.65
Power1_Treat	1	0.70
Power2_Favoured	1	0.71
Power3_Profit	1	0.52
Satisf9_Expect	1	0.62
Satisf10_PriceStock	1	0.60
Satisf1_NetReturn	1	0.73
Satisf2_Support	1	0.66
Satisf3_Policies	1	0.67
Satisf4_Price	1	0.77
Satisf5_PriceSched	1	0.65
Satisf6_Support	1	0.71
Satisf7_CommQuant	1	0.84
Satisf8_CommQual	1	0.81

Item	Initial	Extraction
Value1_GrowBus	1	0.67
Value2_Premium	1	0.68
Value3_NewTech	1	0.66
Value4_Customer	1	0.67
Value5_ReduceCost	1	0.65
Value6_Profit	1	0.74
Value7_ProdRisk	1	0.72
Value8_MktRisk	1	0.65
C.SocCap10_Freq	1	0.76
C.SocCap1_Goals	1	0.85
C.SocCap2_Values	1	0.87
C.SocCap3_Bonds	1	0.85
R.SocCap4_Friend	1	0.83
R.SocCap5_Pers	1	0.89
R.SocCap6_Recip	1	0.85
R.SocCap7_Trust	1	0.90
S.SocCap8_Funct	1	0.84
S.SocCap9_Level	1	0.83
Commit3_Proud	1	0.70
Commit_RelLongTerm	1	0.61
SpecInv1_Reqs	1	0.69
SpecInv2_Know	1	0.71
SpecInv3_Modify	1	0.81
Trust1_Expl	1	0.68
Trust2_Welfare	1	0.77
Trust3_Agree	1	0.73
Trust4_Fair	1	0.77
Trust5_Advantge	1	0.73
Tust6_Returns	1	0.71

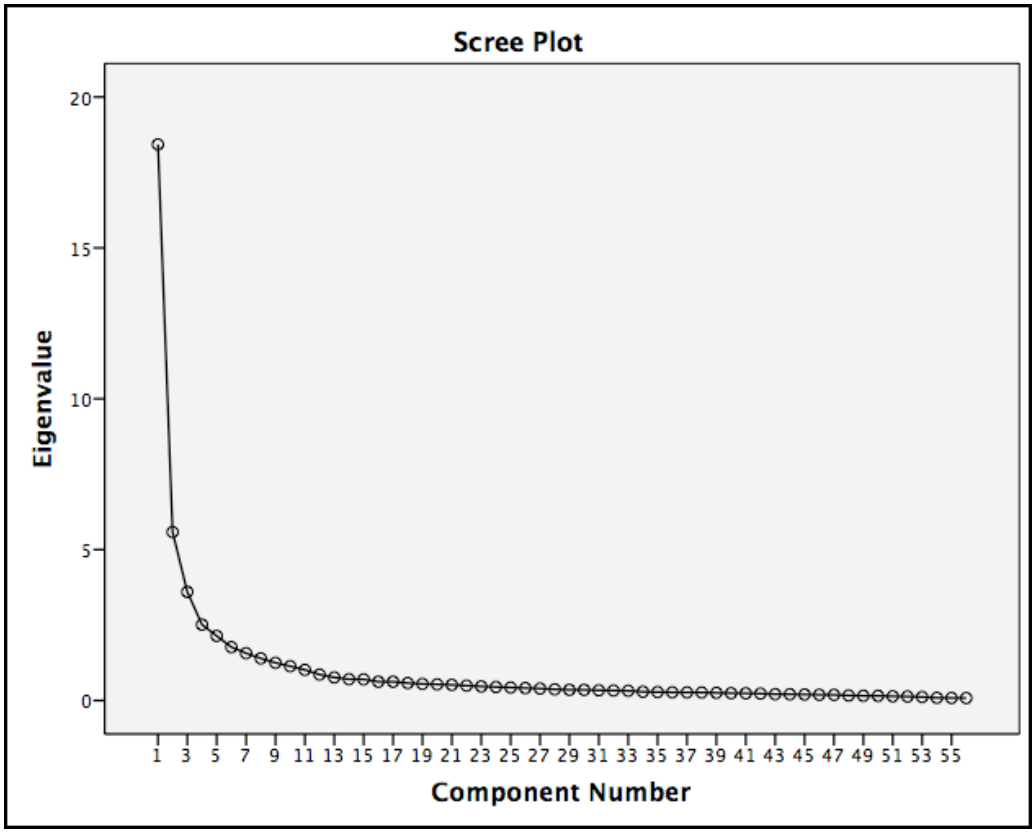

Figure B 1: Scree plot for relationship factors

Table B: 2 Communalities supplier scale items

Code	Initial	Extraction
SuppAbil4_Inn	1.00	0.79
SuppAbil1_Quality	1.00	0.74
SuppAbil2_Mgmt	1.00	0.83
SuppAbil3_Effic	1.00	0.80
SuppComm_Inform1	1.00	0.83
SuppComm_Inform2	1.00	0.85
Costomer1_Needs	1.00	0.66
Customer2_Soln	1.00	0.67
Customer3_Mod	1.00	0.45
Customer4_know	1.00	0.47
Customer5_InnMkt	1.00	0.54
Customer7_Reqs	1.00	0.46
SuppIndep1	1.00	0.62
SuppIndep2	1.00	0.66
ProcDepend1	1.00	0.85
ProcDepend2	1.00	0.84
SuppDepend1	1.00	0.80
SuppDepend2	1.00	0.81
FarmPerf1_ProfitR	1.00	0.72
FarmPerf3_SatProd	1.00	0.44
FarmPerf4_$1SatFin	1.00	0.81
SuppPerf1_Farm	1.00	0.71
SuppPerf2_QLStock	1.00	0.64
SuppPerf3_Yield	1.00	0.56
SuppPerf4_AWelfare	1.00	0.50
SuppPerf5_NoPremium	1.00	0.41
SelfDirect1_Profit	1.00	0.68
SelfDirect2_Prod	1.00	0.67
SelfDirect3_Constr	1.00	0.55
UncertMkt1_Comp	1.00	0.61
UncertMkt2_Cust	1.00	0.69
UncertMkt3_Price	1.00	0.59

Extraction Method: Principal Component Analysis.

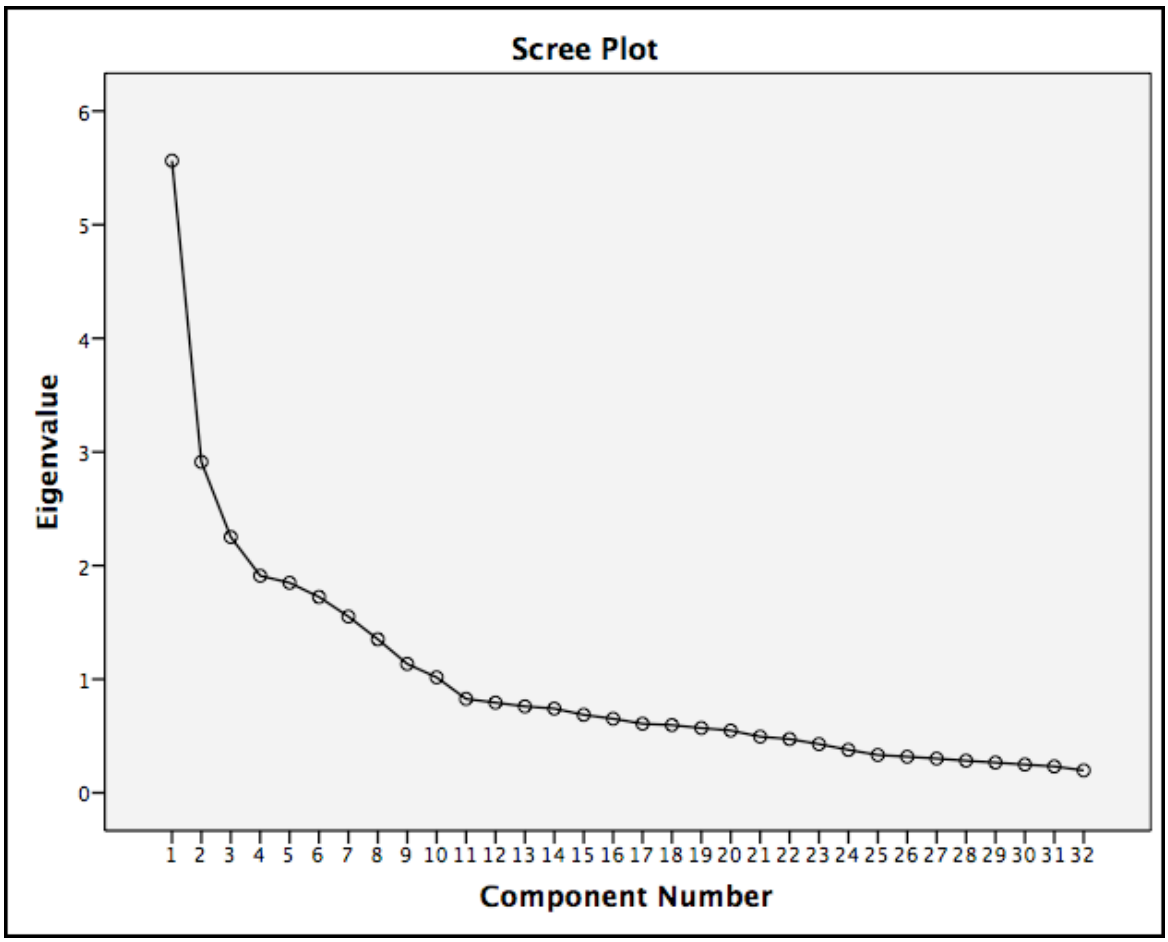

Figure B 2: Scree plot for supplier factors

Table B: 1 Comparison of two methods structuring EFA

Factor Analysis RQ and SC only	Factor Loading	Alpha
1. Social Capital Cognitive and Relational		**0.97**
C.SocCap2_Values	0.88	
R.SocCap5_Pers	0.88	
C.SocCap1_Goals	0.87	
R.SocCap7_Trust	0.87	
C.SocCap3_Bonds	0.87	
R.SocCap4_Friend	0.86	
R.SocCap6_Recip	0.86	
2. Social capital - structural		9.1
S.SocCap8_Funct	0.75	
S.SocCap9_Level	0.74	
C.SocCap10_Freq	0.59	
5. Trust and Commitment		0.92
Commit1_RelLongTerm	0.72	
Commit3_Proud	0.70	
Trust2_Welfare	0.69	
Trust4_Fair	0.69	
Trust5_Advantge	0.68	
Commit2_Resource	0.67	
Trust1_Expl	0.66	
Trust3_Agree	0.66	
Trust6_Returns	0.64	
8. Satisfaction with price		0.8
Satisf9_Ep$Expect	0.78	
Satisf4_Price	0.77	
Satisf10_PriceStock	0.76	
Satisf5_PriceSched	0.65	
9. Satisfaction with communication		0.88
Satisf7_CommQuant	0.84	
Satisf8_CommQual	0.82	
Satisf6_Support	0.75	
7. Satisfaction with buyer		0.9
Satisf1_NetReturn	0.80	
ProcAbil3_Prem	0.80	
ProcAbil2_SChain	0.79	
ProcAbi1_Mktg	0.78	
Satisf3_Policies	0.68	
Satisf2_Support	0.63	

Factor Analysis Relationship factors	Loading	Alpha
1. Social Capital Cognitive and Relational		**0.97**
C.SocCap2_Values	0.87	
R.SocCap5_Pers	0.87	
C.SocCap1_Goals	0.86	
R.SocCap7_Trust	0.86	
R.SocCap6_Recip	0.85	
R.SocCap4_Friend	0.85	
C.SocCap3_Bonds	0.85	
2. Social capital - structural		**0.91**
S.SocCap8_Funct	0.72	
S.SocCap9_Level	0.72	
C.SocCap10_Freq	0.6	
5. Trust and Commitment		0.93
Trust5_Advantge	0.66	
Trust2_Welfare	0.66	
Trust1_Expl	0.66	
Trust4_Fair	0.65	
Trust6_Returns	0.63	
Trust3_Agree	0.63	
Commit1_RelLongTerm	0.57	
Commit3_Proud	0.57	
Commit2_Resource	0.52	
8. Satisfaction with price		**0.82**
Satisf10_PriceStock	0.74	
Satisf4_Price	0.73	
Satisf9_Ep$Expect	0.71	
Satisf5_PriceSched	0.65	
9. Satisfaction with communication		**0.88**
Satisf7_CommQuant	0.78	
Satisf8_CommQual	0.77	
Satisf6_Support	0.71	
7. Satisfaction with buyer		**0.91**
ProcAbi1_Mktg	0.78	
ProcAbil3_Prem	0.78	
ProcAbil2_SChain	0.78	
Satisf1_NetReturn	0.76	
Satisf3_Policies	0.68	
Satisf2_Support	0.64	

Appendix C – Constructs and confirmatory factor analysis

Table C: 1- Variable codes and descriptions

Scale item code	Description of scale item
SuppAbil4_Inn	Management ability to implement innovation and new technology
SuppAbil1_Qual	Management ability to produce high-quality stock
SuppAbil2_Mgmt	Overall farm management skills
SuppSuppAbil3_Eff	Management ability to reduce production costs and increase farm efficiency
ProcAbi1_Mktg	Their marketing and sales skills.
ProcAbil2_SChain	Their skills for improving quality and efficiency in the supply chain.
ProcAbil3_Prem	Their ability to get a premium price from the market
Clim_SPRG	Spring temperature of your [product] unit?
Clim_SUM	Summer climate of your operation
Clim_WINT	Winter temperature of your operation
SupplyContr	In the last year have you supplied [product] on contract (with quality and or delivery specifications).
SupplyContrYrs	For how many years have you supplied [product] on contract to your [processor]?
SupplyContr%	What % of your [product] sales were supplied on contract?
SupplyContr%	What percent of your total [product] sales were supplied on contract?
CommitOpt	It is important to have more than one option to sell our stock
CommitL1_OptRev	Reverse Score of: It is important to have more than one option to sell our stock
CommitL2_PriceComp	How would you react if one of your processors competitors consistently offered a higher price for your animals.
CommitL3_PriceRev	Reverse score of: If the price was good it doesn't matter who we supply our stock to
CommitL4_SpotMktR	Reverse Score of: You will always get better prices over the season if you play the market
CommitRep1	If our current livestock buyer moved to another [processor] we would change also
CommitRep2	The commitment we have to our livestock buyer is more important than the commitment to our [processor]
CommitPrice	If the price was good it doesn't matter who we supply our stock to
Commit1_LTermRel	We expect our relationship with Processor to continue for a long time
Commit2_Resource	We are willing to dedicate time, effort and resources to support Processor in growing their markets and sales
Commit3_Proud	We are proud to tell other farmers that we are a supplier to [processor]
Commit4_LTInv	We are willing to make long term investments to better meet the requirements of our [processor]

Scale item code	Description of scale item
Commit5_Outcome	The business outcomes achieved by supplying [processor] are more attractive than those of other companies.
CommFace	How often would you have face to face contact with someone from your [processor].
CommPhone	How often would you have contact with someone from [processor] (by phone, email or text).
SuppComm_Inform1	Keeping [processor] informed on our production plans is very important to us.
SuppComm_Inform2	We always let [processor] know as soon as possible of any unexpected problems.
SuppCost1_Risk	The costs and risks; involved in supplying [processor] are greater than the benefits.
SuppCost2_Flex	Reduced flexibility in our farming operation.
SuppCost3_Incr	Increased production costs.
SuppCost4_Stress	Extra management effort stress.
SuppCost7_ProdRisk	Increased production risk on our farm (production uncertainty).
SuppCost5_LessProfit	Reduced farm profitability.
SuppCost6_MktRisk	Increased market risk involved in selling our [product] (price uncertainty).
CostFocus2	Reducing the costs on our farm is the most important thing to us.
CostFocus1_ProdCost	We continually try to improve our farm performance by lowing our costs of production.
Customer_Underst	We try to understand customers to recognise their needs.
Costomer1_Needs	We continually try to understand the needs of our customers even ones of which they are unaware.
Customer2_Soln	We try incorporate solutions to future customer needs into to farming operation.
Customer3_Mod	We are willing to modify our production practices to meet customer requirements even if it increases our costs.
Customer4_know	It is important for me to know who the customer of our [product] is.
Customer5_InnMkt	We are always looking for innovative ways to market our products.
Customer7_Reqs	We have made significant changes to our farming operation to better meet customer requirements.
Customer8_Diff	We are always looking for ways to differentiate our farm products and gain a premium price.
SuppDep%_Inc	Approximately what % of your total farm income comes from [processor]?
SuppIndep1	As a farm business, we try to remain as independent as possible.
SuppIndep2	We are always wary of becoming too locked in to one company that buys our stock.
SuppOptions	How many other companies are there in your area that you could potentially supply your stock to?
ProcDepend1	Our [processor] is more dependent on us than we are on them.
ProcDepend2	Regarding your current [product] [processor]: Our [processor] is very dependent on us.

Scale item code	Description of scale item
SuppDepend1	As a business, we feel very dependent on [processor]?
SuppDepend2	We are more dependent on [processor] than they are on us.
EduAgOrg	If you have completed agricultural training or education which organisation did you attend?
EducationMax	What was the highest level of education you attained?
FarmPerf$2_Profit	The profitability of our [product] operation was not satisfactory last year.
FarmPerf2CompProfit	Compared the profitability of your [product] operation over the last 3 years?
FarmPerf3_SatProdn	We were very satisfied with the overall performance of our [product] operation last year?
FarmPerf4_1SatFin	We were very satisfied with the overall financial performance of our [product] operation last year?
FarmPerf1_$2ProfitR	Reverse of the profitability of our [product] operation was not satisfactory last year?
FarmSize_TotUnit	Total farm size per stock unit.
FarmSize_Prod	Farm size [product] effective Area (Hectares).
FarmSize_Total	Farm Effective Area (Hectares).
Farm_Units	Distinct, geographically separate blocks (more than ½ km apart) comprise y farm operation?
FarmSizeStatsNZ	Farm size classified by Stats NZ Categories.
Gender	Gender.
Infl1_Strat	How much influence do you have for long term strategic decisions?
Infl2_Tact	How much influence do you have for day to day (tactical) management decisions?
Irrigation	Irrigation on you farm?
Irrigation%	Approximately what % area of your operation is irrigated?
LabourUnits	Full time labour units are working on your farm (including yourself)?
LocationIsland	Island farm located?
LStockBuyer	Livestock buyer an employee of your [processor] or are they an independent livestock buyer?
NthIsFarmClass	Which North Island farm class best describes your deer unit?
Ownership	Which best describes the ownership arrangement of your farm?
SuppPerf1_Farm	We continually strive to improve our farm performance.
SuppPerf2_QLStock	We continually strive to improve the quality of our stock.
SuppPerf3_Yield	We continually try to improve our farm performance by improving yields (animal production).
SuppPerf4_AWelfare	I would take steps to improve animal welfare even if it wasn't important to our customers.

Scale item code	Description of scale item
SuppPerf5_NoPremium	We would aim to produce the best quality stock even if we were not able to get a premium for it.
SuppPerf6_Effic	We have consistently managed to improve our farm efficiency.
SuppPerf7_ImpReturn	We continually try to improve our farm performance by achieving higher market returns for our products.
SuppPerf8_QLMkt	Our farm business operates in a market where above average quality is important.
Power1_Treat	If we did not do what processor asked we would not have received very good treatment from them.
Power2_Favour	We felt that by going along with what processor asked, we would have been favoured on other occasions.
Power3_Profit	Our processor has hinted that they would take certain action that would affect our profitability if we didn't meet their requests.
QualDel_Numbers	We always deliver the number animals we agree to supply to processor.
QualDel_Quality	We always deliver the quality of animals the processor requires.
Region	What region is your farm located?
RiskDbtAsset	Total farm debt as percentage of total farm assets-Percent (%).
RiskDbtServ	Debt servicing as a percentage of total farm income-Percent (%).
RiskOffFarmInc	Proportion of non-farm income as percentage of your total gross income.
Role	What role best describes you?
Satisf9_Returns	How do you rate your returns compared to what you would expect to achieve for your animals?
Satisf10_PriceStock	The returns we received for our stock were satisfactory last year.
Satisf_PriceStock3yr	How does the price received for you [product] over the last 3 years compare to other farmers?
Satisf1_NetReturn	Net return to supplying stock.
Satisf2_Support	Support services provided.
Satisf3_Policies	Reasonable policies.
Satisf4_Price	The price received for the animals you supply.
Satisf5_PriceSched	The seasonal structure of the pricing schedule.
Satisf6_Support	The support provided by the stock buyer supply manager.
Satisf7_CommQuant	The quantity (amount, frequency) of communication.
Satisf8_CommQual	The timeliness of communication.
SelfDirect1_Profit	The main things that affect our farm profitability are outside of my control (eg weather, price).
SelfDirect2_Prod	When the farm has shown poor production or profit have been due to circumstance totally out of my control.

Scale item code	Description of scale item
SelfDirect3_Constr	There is little room to make improvements in our farm operation due to natural production constraints.
Shares_Decisions	Owning shares in our processor means I can influence the decisions.
Shares_Influence	The main benefit from owning shares in a processor is ensure you are treated fairly.
Shares_Yes_No	Is your farm business a shareholder in your current [product] processor?
SharesYrs	How many years has your farm business been a shareholder of your [processor]?
SI_FarmClass	Which South Island farm class best describes your deer unit?
C.SocCap10_Freq	Frequent and intensive interaction between both parties.
C.SocCap1_Goals	Having compatible goals and objectives.
C.SocCap2_Values	Having similar values.
C.SocCap3_Bonds	Having strong personal bonds.
R.SocCap4_Friend	Involving personal friendship between both parties.
R.SocCap5_Pers	Involving a close personal interaction between both parties.
R.SocCap6_Recip	Involving give and take (reciprocity) between both parties.
R.SocCap7_Trust	Having strong mutual trust between both parties.
S.SocCap8_Funct	Processor promotes: Interaction between different functions of staff in both businesses.
S.SocCap9_Level	Processor promotes: Interaction between different levels and functions of staff in both businesses.
Soil_Fert	Fertility of the soils on your [product] unit?
SpecInv1_Reqs	We have made significant investments in order to specifically meet the requirements of [processor].
SpecInv2_Know	There has been a considerable specific knowledge we have had to learn to meet the requirements of supplying [processor].
SpecInv3_Modify	We have made significant modifications our farming system specifically to meet the requirements of supplying the [processor].
SpotMkt	You will always get better prices over the season if you play the market.
SpotMkt_Best	We seem to have the ability to know how to buy and sell stock to get the best price from the market.
StageBus	At what stage of the farm business cycle would you describe yourself?
Trust1_Expl	Even if Processor gives us a rather unlikely explanation we are confident that they are telling the truth.
Trust2_Welfare	When making important decisions, Processor is always concerned about our welfare.
Trust3_Agree	We can rely on [processor] to help us in ways not required by our agreement with them.
Trust4_Fair	We believe that Processor will always treat us fairly.

Scale item code	Description of scale item
Trust5_Advantge	We can rely on our processor without any fear they will take advantage of us even if the opportunity arises.
Tust6_Returns	We can rely on our processor to always deliver the best returns from the market.
Trust8_HonComm	Communications from our processor are open and honest.
Trust9_InformComm	I feel informed about the organisation and the activities of processor.
UncertMkt1_Comp	The nature of competition in the international market for our [product] is intense.
UncertMkt2_Cust	There are rapid changes in consumer needs and preferences for our [product].
UncertMkt3_Price	The market price for [product] on the international market is highly volatile.
UncertProd_8mth	The numbers and weight of the animals you can supply to [processor] 8 months ahead?
UncertProd1_8mthR	Reverse of the numbers and weight of the animals you can supply to [processor] 8 months ahead?
UncertProd_Cost3y	Your production costs over 3 years?
UncertProd2_Cost3yR	Reverse of Your production costs over 3 years.
Value1_GrowBus	Grow our farming business.
Value2_Premium	Access premium markets for our farm products.
Value3_NewTech	Adopt new technologies into our farming system (genetics, crops etc).
Value4_Customer	Adapt our production to meet the requirements of customers for our products.
Value5_ReduceCost	Reduce our costs of production.
Value6_Profit	Increase our farm profitability.
Value7_ProdRisk	Reduce the production risk on our farm (production uncertainty).
Value8_MktRisk	Reduce the market risk involved in selling our [product] (price uncertainty).
Yrs_Age	Age in years?
Yrs_Farm	Total years farming?

Table C: 2 Significance levels and regression weights for relationship quality - Model 1

Constructs – Model 1			**Standardised regression weight**	**P**
Trust	<---	Relationship quality	0.92	
Commitment	<---	Relationship quality	0.81	***
Social capital - rel/cog	<---	Relationship quality	0.71	***
Social capital - structural	<---	Relationship quality	0.70	***
Sat org	<---	Relationship quality	0.67	***
Sat price	<---	Relationship quality	0.65	***
Sat comm	<---	Relationship quality	0.64	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 3 Significance levels and regression weights for relationship quality - Model 2

Constructs – Model 2			**Standardised regression weight**	**P**
Satisfaction	<---	Relationship quality	0.92	***
Sat_Org	<---	Satisfaction	0.72	
Sat_Price	<---	Satisfaction	0.72	***
Sat_Comm	<---	Satisfaction	0.71	***
Social capital_structural	<---	Social capital	0.82	
Social capital - RelCog	<---	Social capital	0.79	***
Trust	<---	Relationship quality	0.95	
Commitment	<---	Relationship quality	0.83	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 4 Significance levels and regression weights for relationship quality - Model 3

Constructs – Model 3			**Standardised regression weight**	**P**
Satisfaction	<---	Relationship quality	0.91	***
Social capital	<---	Relationship quality	0.91	***
Trust	<---	Relationship quality	0.93	
Commitment	<---	Relationship quality	0.81	***
Sat org	<---	Satisfaction	0.70	
Sat price	<---	Satisfaction	0.69	***
Sat comm	<---	Satisfaction	0.68	***
Social capital structural	<---	Social capital	0.74	
Social capital rel/cog	<---	Social capital	0.76	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 5 Significance levels and regression weights for relationship quality - Model 4

Constructs – Model 4			**Standardised regression weight**	**P**
Relationship quality	<---	Social capital	0.91	***
Satisfaction	<---	Relationship quality	0.92	***
Sat org	<---	Satisfaction	0.72	
Sat price	<---	Satisfaction	0.72	***
Sat comm	<---	Satisfaction	0.71	***
Social capital structural	<---	Social capital	0.82	
Social capital rel/cog	<---	Social capital	0.79	***
Trust	<---	Relationship quality	0.95	
Commitment	<---	Relationship quality	0.83	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 6 Standardised regression weights for relationship constructs

Scale tem	Construct		Estimat	P
Trust2_Welfare	<---	Trust	0.85	
Trust4_Fair	<---	Trust	0.88	***
Trust5_Advantge	<---	Trust	0.84	***
Trust3_Agree	<---	Trust	0.83	***
Trust1_Epl	<---	Trust	0.78	***
Tust6_Returns	<---	Trust	0.82	***
C.SocCap3_Bonds	<---	SCRelCog	0.90	
R.SocCap4_Friend	<---	SCRelCog	0.88	***
C.SocCap2_Values	<---	SCRelCog	0.89	***
R.SocCap7_Trust	<---	SCRelCog	0.94	***
C.SocCap1_Goals	<---	SCRelCog	0.87	***
R.SocCap5_Pers	<---	SCRelCog	0.94	***
R.SocCap6_Recip	<---	SCRelCog	0.92	***
Commit2_Resource	<---	Commit	0.65	
Commit3_Proud	<---	Commit	0.87	***
Commit1_RelLongTer	<---	Commit	0.75	***
Value6_Profit	<---	Value	0.77	
Value7_ProdRisk	<---	Value	0.78	***
Value5_ReduceCost	<---	Value	0.67	***
Value8_MktRisk	<---	Value	0.72	***
Value1_GrowBus	<---	Value	0.75	***
Value3_NewTech	<---	Value	0.74	***
Value4_Customer	<---	Value	0.74	***
Value2_Premium	<---	Value	0.83	***
SuppCost7_ProdRisk	<---	Cost	0.88	
SuppCost3_Incr	<---	Cost	0.83	***
SuppCost4_Stress	<---	Cost	0.78	***
SuppCost5_LessProfit	<---	Cost	0.87	***
SuppCost2_Flex	<---	Cost	0.69	***
SuppCost6_MktRisk	<---	Cost	0.73	***

Scale tem	Construct		Estimat	P
ProcAbil3_Prem	<---	SAT	0.90	
Satisf1_NetReturn	<---	SAT	0.74	***
ProcAbi1_Mktg	<---	SAT	0.78	***
ProcAbil2_SChain	<---	SAT	0.78	***
Satisf3_Policies	<---	SAT	0.77	***
Satisf2_Support	<---	SAT	0.75	***
S.SocCap8_Funct	<---	SoCAPSt	0.90	
C.SocCap10_Freq	<---	SoCAPSt	0.82	***
S.SocCap9_Level	<---	SoCAPSt	0.91	***
Satisf7_CommQuant	<---	SATCom	0.94	
Satisf8_CommQual	<---	SATCom	0.91	***
Satisf6_Support	<---	SATCom	0.61	***
SpecInv3_Modify	<---	SpecificI	0.82	
SpecInv2_Know	<---	SpecificI	0.84	***
SpecInv1_Reqs	<---	SpecificI	0.76	***
CommitL3_PriceRev	<---	Loyalty	0.77	
~~CommitL1_OptRev*~~	~~<---~~	~~Loyalty~~	~~0.54~~	~~***~~
CommitL5_SuplOne	<---	Loyalty	0.68	***
CommitL4_SpotMktR	<---	Loyalty	0.62	***
Satisf10_PriceStock	<---	SATPrice	0.53	
Satisf4_Price	<---	SATPrice	0.87	***
Satisf5_PriceSched	<---	SATPrice	0.80	***
ProcDepend1	<---	ProcDep	0.67	
ProcDepend2	<---	ProcDep	0.96	***
Power1_Treat	<---	Power	0.61	
~~Power2_Favoured*~~	~~<---~~	~~Power~~	~~0.33~~	~~***~~
Power3_Profit	<---	Power	0.69	***

* deleted items

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 7: Correlations between relationship factors

Correlations			Estimate
Trust	<-->	SCRelCog	0.67
Trust	<-->	Commit	0.78
Trust	<-->	Value	0.65
Trust	<-->	Cost	-0.41
Trust	<-->	SAT	0.59
Trust	<-->	SoCAPSt	0.65
Trust	<-->	SATCom	0.55
Trust	<-->	SpecificInvest	0.13
Trust	<-->	Loyalty	0.44
Trust	<-->	SATPrice	0.63
Trust	<-->	ProcDepend	0.15
Trust	<-->	Power	-0.25
SCRelCog	<-->	Commit	0.55
SCRelCog	<-->	Value	0.48
SCRelCog	<-->	Cost	-0.19
SCRelCog	<-->	SAT	0.46
SCRelCog	<-->	SoCAPSt	0.58
SCRelCog	<-->	SATCom	0.45
SCRelCog	<-->	SpecificInvest	0.14
SCRelCog	<-->	Loyalty	0.31
SCRelCog	<-->	SATPrice	0.41
SCRelCog	<-->	ProcDepend	0.15
SCRelCog	<-->	Power	-0.13
Commit	<-->	Value	0.61
Commit	<-->	Cost	-0.45
Commit	<-->	SAT	0.55
Commit	<-->	SoCAPSt	0.52
Commit	<-->	SATCom	0.53
Commit	<-->	SpecificInvest	0.16
Commit	<-->	Loyalty	0.52
Commit	<-->	SATPrice	0.48
Commit	<-->	ProcDepend	0.11
Commit	<-->	Power	-0.26
Value	<-->	Cost	-0.26
Value	<-->	SAT	0.54
Value	<-->	SoCAPSt	0.61
Value	<-->	SATCom	0.44
Value	<-->	SpecificInvest	0.42
Value	<-->	Loyalty	0.39
Value	<-->	SATPrice	0.52
Value	<-->	ProcDepend	0.29
Value	<-->	Power	0.01
Cost	<-->	SAT	-0.32
Cost	<-->	SoCAPSt	-0.18
Cost	<-->	SATCom	-0.34
Cost	<-->	SpecificInvest	0.29
Cost	<-->	Loyalty	-0.40
Cost	<-->	SATPrice	-0.42
Cost	<-->	ProcDepend	0.13
Cost	<-->	Power	0.55

Correlations			Estimate
SAT	<-->	SoCAPSt	0.47
SAT	<-->	SATCom	0.49
SAT	<-->	SpecificInvest	0.10
SAT	<-->	Loyalty	0.32
SAT	<-->	SATPrice	0.50
SAT	<-->	ProcDepend	0.12
SAT	<-->	Power	-0.23
SoCAPSt	<-->	SATCom	0.53
SoCAPSt	<-->	SpecificInvest	0.32
SoCAPSt	<-->	Loyalty	0.33
SoCAPSt	<-->	SATPrice	0.39
SoCAPSt	<-->	ProcDepend	0.27
SoCAPSt	<-->	Power	-0.01
SATCom	<-->	SpecificInvest	0.05
SATCom	<-->	Loyalty	0.33
SATCom	<-->	SATPrice	0.50
SATCom	<-->	ProcDepend	0.03
SATCom	<-->	Power	-0.25
SpecificInvest	<-->	Loyalty	0.11
SpecificInvest	<-->	SATPrice	-0.11
SpecificInvest	<-->	ProcDepend	0.36
SpecificInvest	<-->	Power	0.54
Loyalty	<-->	SATPrice	0.24
Loyalty	<-->	ProcDepend	0.09
Loyalty	<-->	Power	-0.22
SATPrice	<-->	ProcDepend	-0.05
SATPrice	<-->	Power	-0.29
ProcDepend	<-->	Power	0.31

Significance levels:

p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 8 Standardized regression weights and significance for supplier constructs

Scale items		Construct	Estimate	P
SuppPerf1_Farm	<---	SuppMotivation	0.85	
SuppPerf3_Yield	<---	SuppMotivation	0.65	***
SuppPerf2_QLStock	<---	SuppMotivation	0.72	***
SuppAbil2_Mgmt	<---	SupplierAbility	0.88	
SuppAbil3_Efficiency	<---	SupplierAbility	0.86	***
SuppAbil1_Quality	<---	SupplierAbility	0.78	***
SuppAbil4_Inn	<---	SupplierAbility	0.84	***
Customer2_Soln	<---	CustomerFocus	0.58	
Customer4_know	<---	CustomerFocus	0.64	***
Customer7_Reqs	<---	CustomerFocus	0.67	***
SelfDirect2_Prod	<---	SelfDirect	0.68	
SelfDirect1_Profit	<---	SelfDirect	0.73	***
FarmPerf4_$1SatFin	<---	FarmPerf	0.97	***
FarmPerf1_$2ProfR	<---	FarmPerf	0.67	***
FarmPerf3_SatProd	<---	FarmPerf	0.60	***
SuppComm_Inform2	<---	SuppCom	0.75	
SuppComm_Inform1	<---	SuppCom	0.94	***
ProcDepend1	<---	ProcDepend	0.75	***
ProcDepend2	<---	ProcDepend	0.77	***
SuppDepend2	<---	SupplierDepend	0.77	***
SuppDepend1	<---	SupplierDepend	0.88	
UncertMkt1_Comp	<---	Uncert	0.49	
UncertMkt2_Cust	<---	Uncert	0.95	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table C: 9 Correlations between supplier constructs

Construct		Construct	Estimate
SuppMotivation	<-->	SupplierAbility	0.45
SuppMotivation	<-->	CustomerFocus	0.39
SuppMotivation	<-->	SelfDirect	0.11
SuppMotivation	<-->	FarmPerf	-0.14
SuppMotivation	<-->	SuppCom	0.34
SupplierAbility	<-->	CustomerFocus	0.36
SupplierAbility	<-->	SelfDirect	-0.13
SupplierAbility	<-->	FarmPerf	0.00
SupplierAbility	<-->	SuppCom	0.23
CustomerFocus	<-->	SelfDirect	-0.02
CustomerFocus	<-->	FarmPerf	0.02
CustomerFocus	<-->	SuppCom	0.50
SelfDirect	<-->	FarmPerf	-0.12
SelfDirect	<-->	SuppCom	0.00
FarmPerf	<-->	SuppCom	0.03
SuppCom	<-->	DepSuppProc	0.21
FarmPerf	<-->	DepSuppProc	0.01
SelfDirect	<-->	DepSuppProc	0.12
CustomerFocus	<-->	DepSuppProc	0.27
SupplierAbility	<-->	DepSuppProc	0.13
SuppMotivation	<-->	DepSuppProc	0.12
SuppMotivation	<-->	SupplierDepend	0.12
SupplierAbility	<-->	SupplierDepend	-0.02
CustomerFocus	<-->	SupplierDepend	0.21
SelfDirect	<-->	SupplierDepend	0.21
FarmPerf	<-->	SupplierDepend	-0.08
SuppCom	<-->	SupplierDepend	0.28
ProcDepend	<-->	SupplierDepend	0.20
ProcDepend	<-->	Uncertainty	0.18
SuppCom	<-->	Uncertainty	0.10
FarmPerf	<-->	Uncertainty	0.04
SelfDirect	<-->	Uncertainty	0.09
CustomerFocus	<-->	Uncertainty	0.27
SupplierAbility	<-->	Uncertainty	0.08
SuppMotivation	<-->	Uncertainty	0.10
SupplierDepend	<-->	Uncertainty	0.03

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Appendix D - Invariance tests

The factor structure and loadings are sufficiently equivalent across groups as shown below. If the constructs do not meet the test of invariance then they may be measuring different latent constructs for each group.

Table D: 1 Invariance test supplier factors: Beef and Sheep data

			Beef		Sheep		
Measure		Construct	Estimate	P	Estimate	P	-stat
SuppAbil3_Efficiency	<---	SupplierAbility	1.064	0.000	0.935	0.000	-1.540
SuppAbil1_Quality	<---	SupplierAbility	0.945	0.000	0.950	0.000	0.052
SuppAbil4_Inn	<---	SupplierAbility	1.056	0.000	0.918	0.000	-1.608
SuppPerf2_QLStock	<---	SuppPerf	0.793	0.000	0.861	0.000	0.642
SuppPerf3_Yield	<---	SuppPerf	0.647	0.000	0.833	0.000	1.739*
SuppPerf4_AWelfare	<---	SuppPerf	0.458	0.000	0.721	0.000	2.036**
SuppPerf5_NoPremium	<---	SuppPerf	0.459	0.000	0.767	0.000	2.258**
Customer4_know	<---	CustomerFocus	1.178	0.000	1.304	0.000	0.579
Customer7_Reqs	<---	CustomerFocus	1.287	0.000	1.239	0.000	-0.227
Customer3_Mod	<---	CustomerFocus	0.743	0.000	0.964	0.000	1.211
Customer5_InnMkt	<---	CustomerFocus	1.166	0.000	0.890	0.000	-1.373
Customer8_Diff	<---	CustomerFocus	1.078	0.000	0.927	0.000	-0.792
SelfDirect1_Profit	<---	SelfDirect	1.107	0.000	1.156	0.000	0.219
SelfDirect3_Constr	<---	SelfDirect	0.950	0.000	0.916	0.000	-0.167
FarmPerf4_$1SatFin	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
FarmPerf1_$2ProfR	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
FarmPerf3_SatProd	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
UncertMkt1_Comp	<---	Uncert	0.585	0.000	0.987	0.000	2.496**
UncertMkt3_Price	<---	Uncert	1.012	0.000	0.797	0.000	-1.114
SuppDepend1	<---	SupplierDepend	0.739	0.000	1.104	0.000	1.741*
ProcDepend1	<---	ProcDepend	0.973	0.000	0.973	0.000	0.000
ProcDepend2	<---	ProcDepend	0.973	0.000	0.973	0.000	0.000
SuppIndep1	<---	SuppInd	1.309	0.003	0.508	0.000	-1.781*

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table D: 2: Invariance Test – Supplier factors: Sheep and Venison supplier data

			Sheep		Venison		
Measure		Construct	Estimate	P	Estimate	P	-stat
SuppAbil3_Efficiency	<---	SupplierAbility	0.935	0.000	0.900	0.000	-0.504
SuppAbil1_Quality	<---	SupplierAbility	0.950	0.000	1.026	0.000	0.853
SuppAbil4_Inn	<---	SupplierAbility	0.918	0.000	0.894	0.000	-0.326
SuppPerf2_QLStock	<---	SuppPerf	0.861	0.000	0.745	0.000	-1.176
SuppPerf3_Yield	<---	SuppPerf	0.833	0.000	0.889	0.000	0.475
SuppPerf4_AWelfare	<---	SuppPerf	0.721	0.000	0.882	0.000	1.259
SuppPerf5_NoPremium	<---	SuppPerf	0.767	0.000	0.584	0.000	-1.368
Customer4_know	<---	CustomerFocus	1.304	0.000	1.057	0.000	-1.159
Customer7_Reqs	<---	CustomerFocus	1.239	0.000	0.864	0.000	-2.002**
Customer3_Mod	<---	CustomerFocus	0.964	0.000	0.608	0.000	-2.003**
Customer5_InnMkt	<---	CustomerFocus	0.890	0.000	1.009	0.000	0.625
Customer8_Diff	<---	CustomerFocus	0.927	0.000	0.720	0.000	-1.188
SelfDirect1_Profit	<---	SelfDirect	1.156	0.000	0.883	0.000	-1.417
SelfDirect3_Constr	<---	SelfDirect	0.916	0.000	0.744	0.000	-0.975
FarmPerf4_SatFin	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
FarmPerf1_ProfR	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
FarmPerf3_SatProd	<---	FarmPerf	0.973	0.000	0.973	0.000	0.000
UncertMkt1_Comp	<---	Uncert	0.987	0.000	0.931	0.000	-0.343
UncertMkt3_Price	<---	Uncert	0.797	0.000	0.532	0.000	-1.926*
SuppDepend1	<---	SupplierDepend	1.104	0.000	1.113	0.000	0.035
ProcDepend1	<---	ProcDepend	0.973	0.000	0.973	0.000	0.000
ProcDepend2	<---	ProcDepend	0.973	0.000	0.973	0.000	0.000
SuppIndep1	<---	SuppInd	0.508	0.000	1.036	0.000	1.699*

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

Table D: 3 Invariance test supplier factors: Beef and sheep supplier data

			Beef		**Sheep**		
Measure		Construct	Estimate	P	Estimate	P	-stat
R.SocCap5_Pers	<---	SocialCapital_RelCog	1.180	0.000	1.297	0.000	1.178
C.SocCap1_Goals	<---	SocialCapital_RelCog	0.975	0.000	0.950	0.000	-0.336
R.SocCap7_Trust	<---	SocialCapital_RelCog	1.189	0.000	1.364	0.000	1.795*
R.SocCap6_Recip	<-	SocialCapital_RelCog	1.165	0.000	1.225	0.000	0.610
R.SocCap4_Friend	<---	SocialCapital_RelCog	1.036	0.000	1.162	0.000	1.198
C.SocCap3_Bonds	<---	SocialCapital_RelCog	1.137	0.000	1.269	0.000	1.234
Value7_ProdRisk	<---	Value	1.067	0.000	1.167	0.000	0.862
Value6_Profit	<---	Value	1.101	0.000	1.293	0.000	1.648
Value1_GrowBus	<---	Value	1.207	0.000	1.289	0.000	0.622
Value3_NewTech	<---	Value	0.935	0.000	1.215	0.000	2.206**
Value4_Customer	<---	Value	1.112	0.000	1.105	0.000	-0.055
Value8_MktRisk	<---	Value	1.056	0.000	1.168	0.000	0.868
Value2_Premium	<---	Value	1.209	0.000	1.414	0.000	1.451
SuppCost3_Incr	<---	Cost_Risk	0.995	0.000	1.009	0.000	0.201
SuppCost4_Stress	<---	Cost_Risk	1.017	0.000	0.993	0.000	-0.330
SuppCost5_LessProfit	<---	Cost_Risk	1.031	0.000	1.035	0.000	0.047
SuppCost2_Flex	<---	Cost_Risk	0.761	0.000	0.871	0.000	1.456
Cost6_MktRisk	<---	Cost_Risk	0.886	0.000	0.861	0.000	-0.377
Trust2_Welfare	<---	Trust_Commit	1.047	0.000	1.047	0.000	0.000
Trust1_Epl	<---	Trust_Commit	0.899	0.000	0.915	0.000	0.189
Trust4_Fair	<---	Trust_Commit	0.982	0.000	1.104	0.000	1.600
Tust6_Returns	<---	Trust_Commit	0.956	0.000	0.953	0.000	-0.045
Trust3_Agree	<---	Trust_Commit	1.006	0.000	1.022	0.000	0.196
Commit1_RelLongTerm	<---	Trust_Commit	0.676	0.000	0.600	0.000	-1.040
Commit3_Proud	<---	Trust_Commit	0.778	0.000	0.759	0.000	-0.238
Commit2_Resource	<---	Trust_Commit	0.678	0.000	0.580	0.000	-1.126
ProcAbil3_Prem	<---	Sat_Org	1.223	0.000	1.042	0.000	-1.635
ProcAbil2_SChain	<---	Sat_Org	1.060	0.000	1.016	0.000	-0.450
Satisf1_NetReturn	<---	Sat_Org	1.111	0.000	0.953	0.000	-1.481
Satisf3_Policies	<---	Sat_Org	1.320	0.000	0.921	0.000	-3.335***
Satisf2_Support	<---	Sat_Org	1.291	0.000	0.873	0.000	-3.44***
Satisf4_Price	<---	Sat_Price	1.029	0.000	1.835	0.000	4.421***
Satisf9_Ep$	<---	Sat_Price	0.436	0.000	0.733	0.000	3.406***
Satisf5_PriceSched	<---	Sat_Price	0.810	0.000	1.599	0.000	4.561***
Satisf8_CommQual	<---	Sat_Comm	1.032	0.000	0.877	0.000	-2.382**
Satisf6_Support	<---	Sat_Comm	0.786	0.000	0.641	0.000	-1.975**
CommitL4_SpotMktR	<---	Loyalty	0.738	0.000	0.774	0.000	0.309
CommitL5_SuplOne	<---	Loyalty	0.732	0.000	0.858	0.000	1.051
SpecInv2_Know	<---	Spec_Inv	0.882	0.000	0.824	0.000	-0.700
SpecInv1_Reqs	<---	Spec_Inv	0.949	0.000	0.834	0.000	-1.151
S.SocCap9_Level	<---	SocialCapital_Struct	1.099	0.000	1.009	0.000	-1.420
C.SocCap10_Freq	<---	SocialCapital_Struct	1.006	0.000	0.880	0.000	-1.76*
Power3_Profit	<---	Power	0.889	0.000	1.131	0.000	1.458
Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10							

Appendix E - Antecedents of relationship quality

Table E: 1 Standardized regression weights for antecedents of relationship quality

Variables			Regression weights	P
Relationship quality	<---	ProcDepend	0.12	***
Relationship quality	<---	SupplierNetValue	0.47	***
Relationship quality	<---	Power	-0.48	***
Relationship quality	<---	CustomerFocus	0.19	***
Relationship quality	<---	SuppMotivation	-0.04	0.12
Relationship quality	<---	SupplierDepend	0.10	***
Relationship quality	<---	SpecificInvest	0.28	***
Relationship quality	<---	SelfDirect	-0.01	0.54
Relationship quality	<---	SupplierAbility	0.00	0.91

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 2 Regression weights for control variables – unmediated model

Variables			Regression weights	P
FarmPerf	<---	ClimSpring	0.12	***
FarmPerf	<---	ClimSum	-0.05	0.098
FarmPerf	<---	Farm Size	0.08	0.008
DelNum	<---	Farm Size	0.04	0.241
DelQual	<---	Farm Size	-0.06	0.059
SuppCom	<---	Shares	-0.06	0.024
Loyalty	<---	Shares	-0.21	***
FarmPerf	<---	EducationMax	-0.11	***
FarmPerf	<---	SoilFert	0.06	0.046
FarmPerf	<---	ClimWint	-0.02	0.507
DelNum	<---	UncertProd8mth	0.11	***
DelQual	<---	UncertProd8mth	0.08	0.005

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 3 Correlations for control variables

Variables			Regression weights	P
SupplierAbility	<-->	EducationMax	0.12	***
SuppMotivation	<-->	EducationMax	0.09	0.003
ClimSpring	<-->	ClimSum	-0.20	***
ClimSpring	<-->	Farm Size	-0.06	0.037
ClimSpring	<-->	ClimWint	0.47	***
SoilFert	<-->	ClimWint	0.03	0.327
ClimSum	<-->	ClimWint	-0.11	***
EducationMax	<-->	Age	-0.28	***
Age	<-->	DebtServ	-0.04	0.237
SupplierDepend	<-->	DebtServ	-0.03	0.289
SpecificInvest	<-->	DebtServ	-0.03	0.315
ProcDepend	<-->	DebtServ	-0.07	0.027
SupplierNetValue	<-->	DebtServ	0.05	0.089
CustomerFocus	<-->	Age	0.05	0.094
SelfDirect	<-->	Age	0.01	0.81
SuppMotivation	<-->	Age	-0.09	0.003
SupplierAbility	<-->	Age	-0.11	***
SelfDirect	<-->	Uncertainty	-0.08	0.015
CustomerFocus	<-->	Uncertainty	0.16	***
SuppMotivation	<-->	Uncertainty	0.08	0.002
ProcDepend	<-->	Uncertainty	0.09	0.002
SpecificInvest	<-->	Uncertainty	0.10	***
ProcDepend	<-->	Uncertainty	0.11	***
SelfDirect	<-->	UncertProd8mth	0.12	***
CustomerFocus	<-->	UncertProd8mth	0.07	0.018
SuppMotivation	<-->	UncertProd8mth	0.10	0.003
SupplierAbility	<-->	UncertProd8mth	0.13	***
SupplierNetValue	<-->	UncertProd8mth	0.12	***
SupplierNetValue	<-->	Farm Size	-0.07	0.022
ProcDepend	<-->	Farm Size	0.07	0.004

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 4 Mediation effects of relationship quality on power: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
Power		Relationship quality		-0.47***		
Power	RelQual	SupplierComm	0.06 (ns)	0.04 (ns)	-0.10***	indirect
Power	RelQual	SupplierProfit	-0.10*	0.02 (ns)	-0.11***	indirect
Power	RelQual	SuppLoyalty	-0.42***	-0.24***	-0.18***	Partial
Power	RelQual	DeliveryQual	0.01 (ns)	0.03 (ns)	-0.02 (ns)	no mediation
Power	RelQual	DeliveryQuant	0.03 (ns)	0.09 (ns)	-0.06**	indirect

RelQual=Relationship quality Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 5 Mediation effects of relationship quality on supplier dependence: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
SupplierDepend		Relationship quality		0.10***		
SupplierDepend	Relationship quality	SupplierComm_	0.11**	0.09**	0.02***	partial
SupplierDepend	Relationship quality	SupplierProfit	-0.16***	-0.18***	0.02***	partial
SupplierDepend	Relationship quality	SuppLoyalty	0.20***	0.16***	0.04***	partial
SupplierDepend	Relationship quality	DeliveryQual	0.06 (ns)	0.06 (ns)	0.00 (ns)	no mediation
SupplierDepend	Relationship quality	DeliveryQuant	0.04 (ns)	0.03 (ns)	0.01**	indirect

Table E: 6 Mediation effects of relationship quality on processor dependence: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
ProcDepend		Relationship quality		0.12***	0.00 (ns)	
ProcDepend	Relationship quality	SupplierComm_	0.05 (ns)	0.02 (ns)	0.03***	indirect
ProcDepend	Relationship quality	SupplierProfit	0.05 (ns)	0.02 (ns)	0.03***	indirect
ProcDepend	Relationship quality	SuppLoyalty	-0.01 (ns)	-0.05 (ns)	0.05***	indirect
ProcDepend	Relationship quality	DeliveryQual	-0.04 (ns)	-0.05 (ns)	0.01 (ns)	no mediation
ProcDepend	Relationship quality	DeliveryQuant	-0.02 (ns)	-0.03 (ns)	0.02**	indirect

Table E: 7 Mediation effects of relationship quality on specific investment: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
SpecificInvest		RQ		0.27***	0.00 (ns)	
SpecificInvest	Relationship quality	SupplierComm_	0.16***	0.10*	0.06***	partial
SpecificInvest	Relationship quality	SupplierProfit	0.03 (ns)	-0.03 (ns)	0.07***	indirect
SpecificInvest	Relationship quality	SuppLoyalty	0.22***	0.11**	0.11***	partial
SpecificInvest	Relationship quality	DeliveryQual	0.04 (ns)	0.03 (ns)	0.01 (ns)	no mediation
SpecificInvest	Relationship quality	DeliveryQuant	0.02 (ns)	-0.01 (ns)	0.04**	indirect

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 8 Mediation effects of relationship quality on supplier net value: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
SuppNetValue		Relationship quality		0.46***		
SuppNetValue	Relationship quality	SupplierComm_	0.23***	0.13***	0.10***	partial
SuppNetValue	Relationship quality	SupplierProfit	0.24***	0.13**	0.11***	partial
SuppNetValue	Relationship quality	SuppLoyalty	0.31***	0.13***	0.18***	partial
SuppNetValue	Relationship quality	DeliveryQual	0.04 (ns)	0.017 (ns)	0.02 (ns)	no mediation
SuppNetValue	Relationship quality	DeliveryQuant	0.07 (ns)	0.01 (ns)	0.06**	indirect

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 9 Mediation effects of relationship quality on supplier motivation: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
SupplierProfit		Relationship quality		-0.04 (ns)		
SupplierProfit	Relationship quality	SupplierComm	0.26***	0.27***	-0.01 (ns)	no mediation
SupplierProfit	Relationship quality	SupplierProfit	-0.15***	-0.14***	-0.01 (ns)	no mediation
SupplierProfit	Relationship quality	SuppLoyalty	0.03 (ns)	0.05 (ns)	-0.02 (ns)	no mediation
SupplierProfit	Relationship quality	DeliveryQual	0.21***	0.21***	0.00 (ns)	no mediation
SupplierProfit	Relationship quality	DeliveryQuant	0.23***	0.24***	0.01 (ns)	no mediation

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 10 Mediation effects of relationship quality on self-direction: Standardised regression weights

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
SelfDirect		Relationship quality				
SelfDirect	Relationship quality	SupplierComm	-0.01 (ns)	-0.01 (ns)	0.00 (ns)	no mediation
SelfDirect	Relationship quality	SupplierProfit	0.17***	0.17***	0.00 (ns)	no mediation
SelfDirect	Relationship quality	SuppLoyalty	0.08**	0.09***	-0.01 (ns)	no mediation
SelfDirect	Relationship quality	DeliveryQual	-0.18***	-0.18***	0.00 (ns)	no mediation
SelfDirect	Relationship quality	DeliveryQuant	-0.13***	-0.13***	0.00 (ns)	no mediation

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 11 Mediation effects of relationship quality on customer Focus

Variables			Mediation Effects			
Independent variable	**Mediating variable**	**Dependent variable**	**Direct without mediator**	**Direct with Mediator**	**Indirect through mediator**	**Type of Mediation**
CustomerFocus		Relationship quality		0.19***		
CustomerFocus	Relationship quality	SupplierComm	0.15***	0.10**	0.04***	partial
CustomerFocus	Relationship quality	SupplierProfit	0.01 (ns)	-0.05 (ns)	0.05***	indirect
CustomerFocus	Relationship quality	SuppLoyalty	0.03 (ns)	-0.04 (ns)	0.07***	indirect
CustomerFocus	Relationship quality	DeliveryQual	0.09*	0.09**	0.01 (ns)	no mediation
CustomerFocus	Relationship quality	DeliveryQuant	0.00 (ns)	-0.02 (ns)	0.02**	indirect

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 12 Standardised regression weights – mediation by relationship quality without direct effects

Variables			Regression weights	P
Relationship quality	<---	SupplierDepend	0.10	***
Relationship quality	<---	ProcDepend	0.12	***
Relationship quality	<---	SpecificInvest	0.27	***
Relationship quality	<---	ProcDepend	-0.47	***
Relationship quality	<---	SuppNetValue	0.46	***
Relationship quality	<---	SupplierAbility	0.00	0.906
Relationship quality	<---	Uncertainty	0.05	0.022
Relationship quality	<---	SupplierProfit	-0.04	0.118
Relationship quality	<---	CustomerFocus	0.19	***
Relationship quality	<---	SelfDirect	-0.01	0.537
DeliveryQual	<---	RQ	0.10	0.002
DeliveryQuant	<---	RQ	0.13	***
SupplierComm	<---	RQ	0.39	***
SuppLoyalty	<---	RQ	0.60	***
SupplierProfit	<---	RQ	0.28	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 13 Standardised regression weights - controls

Variables			Regression weights	P
SupplierProfit	<---	Clim_SPRG	0.11	0.002
SupplierProfit	<---	Clim_SUM	-0.05	0.082
SupplierProfit	<---	FarmSize_TotUnit	0.05	0.137
DeliveryQuant	<---	FarmSize_TotUnit	0.06	0.059
DeliveryQual	<---	FarmSize_TotUnit	-0.02	0.47
SupplierComm	<---	Shares_Yes_No	-0.12	***
SuppLoyalty	<---	Shares_Yes_No	-0.22	***
SupplierProfit	<---	Soil_Fert	0.06	0.07
SupplierProfit	<---	Clim_WINT	0.01	0.842
DeliveryQuant	<---	UncertProd1_8mthR	0.12	***
DeliveryQual	<---	UncertProd1_8mthR	0.09	0.003

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 14 Correlations – mediation by relationship quality only (no direct effects)

Variables			Regression weights	P
CustomerFocus	<-->	SelfDirect	-0.03	0.41
CustomerFocus	<-->	SupplierProfit	0.42	***
SelfDirect	<-->	SupplierProfit	-0.14	***
SupplierProfit	<-->	SuppNetValue	0.14	***
SupplierProfit	<-->	ProcDepend	0.06	0.056
SupplierProfit	<-->	SpecificInvest	0.20	***
CustomerFocus	<-->	SuppNetValue	0.14	***
CustomerFocus	<-->	ProcDepend	0.18	***
CustomerFocus	<-->	SpecificInvest	0.36	***
SelfDirect	<-->	SuppNetValue	0.22	***
SelfDirect	<-->	ProcDepend	-0.19	***
SelfDirect	<-->	SpecificInvest	-0.10	0.003
ProcDepend	<-->	SpecificInvest	0.67	***
SuppNetValue	<-->	SpecificInvest	0.04	0.267
SuppNetValue	<-->	ProcDepend	-0.36	***
SpecificInvest	<-->	ProcDepend	0.35	***
ProcDepend	<-->	ProcDepend	0.23	***
SuppNetValue	<-->	ProcDepend	0.04	0.19
SupplierProfit	<-->	ProcDepend	0.14	***
CustomerFocus	<-->	ProcDepend	0.17	***
SelfDirect	<-->	ProcDepend	-0.09	0.005
ProcDepend	<-->	SupplierDepend	0.11	***
SpecificInvest	<-->	SupplierDepend	0.47	***
ProcDepend	<-->	SupplierDepend	0.28	***
SuppNetValue	<-->	SupplierDepend	0.12	***
SupplierProfit	<-->	SupplierDepend	0.13	***
CustomerFocus	<-->	SupplierDepend	0.12	***
SelfDirect	<-->	SupplierDepend	-0.18	***
SuppNetValue	<-->	SupplierAbility	0.12	***
ProcDepend	<-->	SupplierAbility	0.03	0.376
SpecificInvest	<-->	SupplierAbility	0.13	***
ProcDepend	<-->	SupplierAbility	0.13	***
SupplierDepend	<-->	SupplierAbility	0.02	0.59
SelfDirect	<-->	SupplierAbility	0.03	0.404
CustomerFocus	<-->	SupplierAbility	0.26	***
SupplierProfit	<-->	SupplierAbility	0.59	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 15 Correlations for control variable – mediation by relationship quality (no direct effects)

Control Variables			Regression weights	P
SupplierAbility	<-->	EducationMax	0.12	***
SupplierProfit	<-->	EducationMax	0.09	0.003
Clim_SPRG	<-->	Clim_SUM	-0.20	***
Clim_SPRG	<-->	Farm_Size_	-0.06	0.037
Clim_SPRG	<-->	Clim_WINT	0.47	***
Soil_Fert	<-->	Clim_WINT	0.03	0.327
Clim_SUM	<-->	Clim_WINT	-0.11	***
EducationMax	<-->	Yrs_Age	-0.28	***
Yrs_Age	<-->	RiskDbtServ	-0.04	0.237
SupplierDepend	<-->	RiskDbtServ	-0.03	0.289
SpecificInvest	<-->	RiskDbtServ	-0.03	0.315
ProcDepend	<-->	RiskDbtServ	-0.07	0.027
SuppNetValue	<-->	RiskDbtServ	0.05	0.089
CustomerFocus	<-->	Yrs_Age	0.05	0.094
SelfDirect	<-->	Yrs_Age	0.01	0.81
SupplierProfit	<-->	Yrs_Age	-0.09	0.003
SupplierAbility	<-->	Yrs_Age	-0.11	***
SelfDirect	<-->	Uncertainty	-0.08	0.015
CustomerFocus	<-->	Uncertainty	0.16	***
SupplierProfit	<-->	Uncertainty	0.08	0.002
ProcDepend	<-->	Uncertainty	0.09	0.002
SpecificInvest	<-->	Uncertainty	0.10	***
ProcDepend	<-->	Uncertainty	0.11	***
SelfDirect	<-->	UncertProd1_8mthR	0.12	***
CustomerFocus	<-->	UncertProd1_8mthR	0.07	0.018
SupplierProfit	<-->	UncertProd1_8mthR	0.10	0.003
SupplierAbility	<-->	UncertProd1_8mthR	0.13	***
SuppNetValue	<-->	UncertProd1_8mthR	0.12	***
SuppNetValue	<-->	FarmSize_TotUnit	-0.07	0.022
ProcDepend	<-->	FarmSize_TotUnit	0.07	0.004

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Effects of supplier and relationship characteristics of supplier performance variables (with and without mediation).

Self-direction

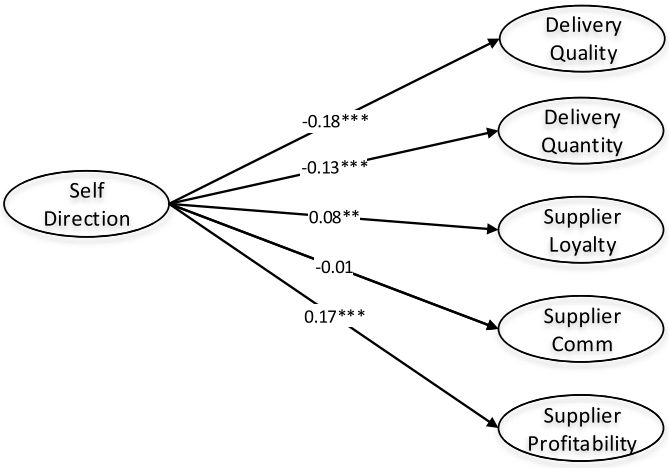

Figure E: 1 Direct effects of self-direction on supplier performance (no mediation)

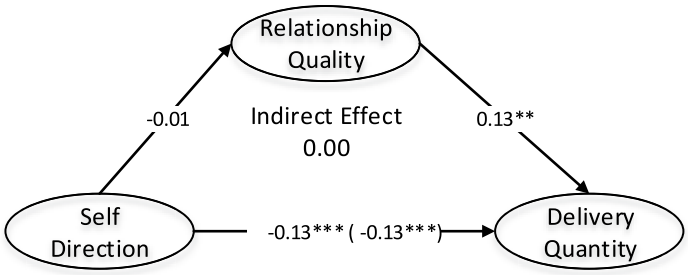

Figure E: 2 Direct and indirect effects of self-direction on delivery quantity

Self-direction had a significant negative direct effect on delivery quantity and no significant mediation through relationship quality.

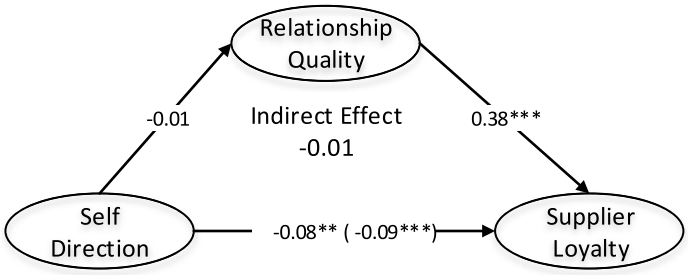

Figure E: 3 Direct and indirect effects of self-direction on supplier loyalty

Self-direction had significant negative effect on supplier loyalty and no significant mediation through Relationship quality.

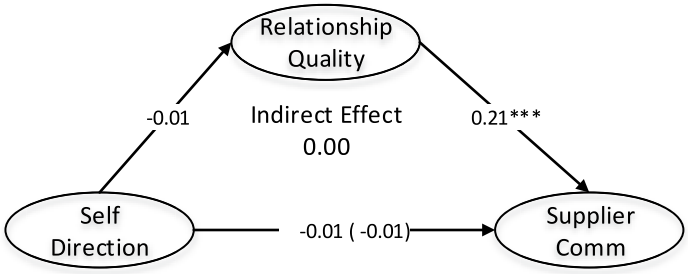

Figure E: 4 Direct and indirect effects of self-direction on supplier communication

Self-direction had no significant direct or indirect effect on supplier communication and no significant mediation through relationship quality.

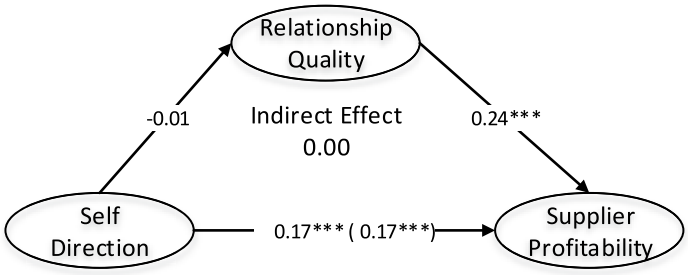

Figure E: 5 Direct and indirect effects of self-direction on supplier profitability

Self-direction has a significant direct effect on supplier profitability and no significant mediation through relationship quality.

Supplier net value

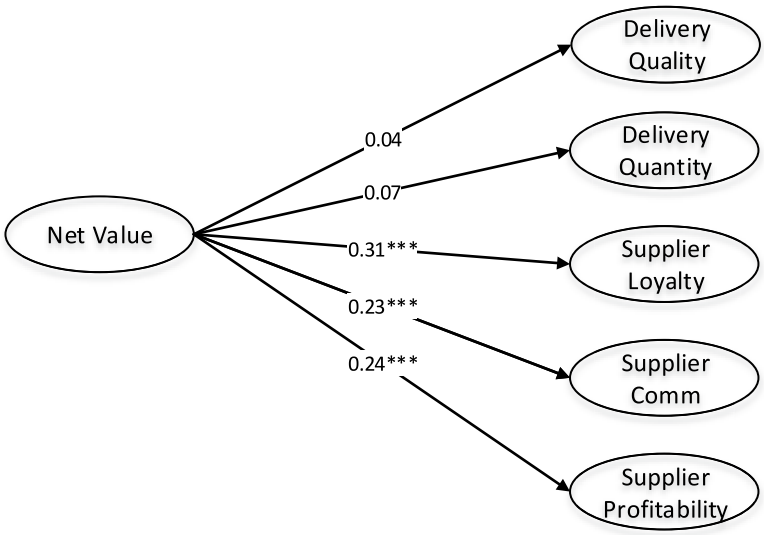

Figure E: 6 Direct effects of net value on supplier performance variables (no mediation)

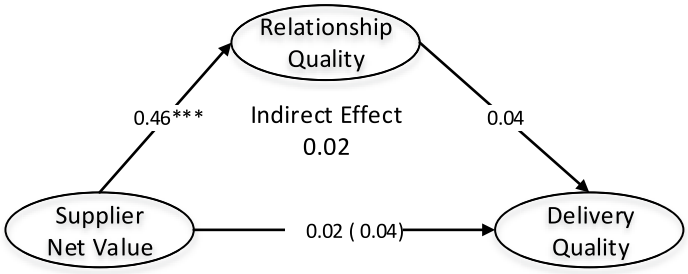

Figure E: 7 Direct and indirect effects of supplier net value on delivery quality

There is no significant direct or indirect effect of supplier net value on delivery quality.

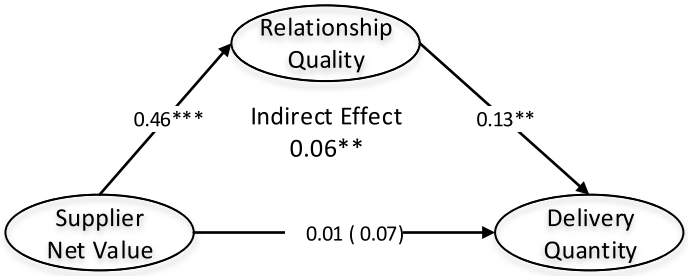

Figure E: 8 Direct and indirect effects of supplier net value on delivery quantity

Indirect effect: Supplier net value affects delivery quantity positively and indirectly through relationship quality. There is no direct effect of supplier net value on delivery quality.

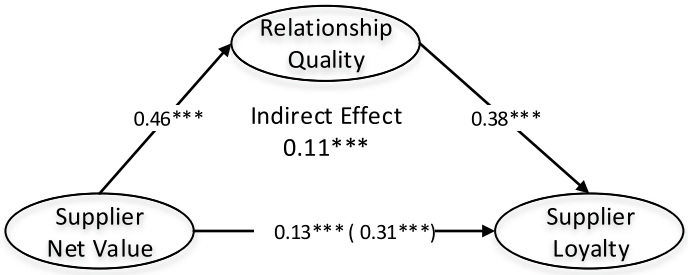

Figure E: 9 Direct and indirect effects of supplier net value on supplier loyalty

Partial mediation: Relationship quality positively and partially mediates the positive relationship between supplier net value and supplier loyalty.

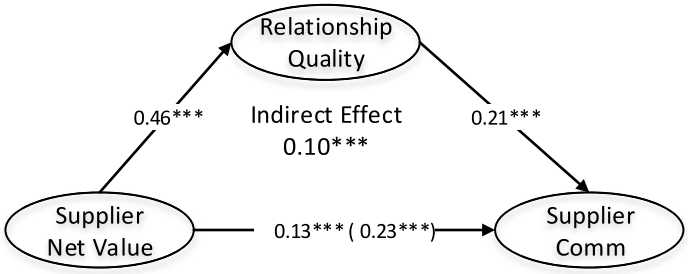

Figure E: 10 Direct and indirect effects of supplier net value on supplier communication

Partial mediation: Relationship quality positively and partially mediates the positive relationship between supplier net value and supplier communication.

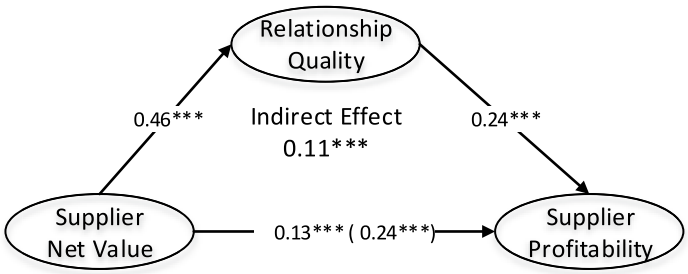

Figure E: 11 Direct and indirect effects of supplier net value supplier profitability

Partial mediation: Relationship quality positively and partially mediates the positive relationship between supplier net value and supplier profitability.

Customer Focus

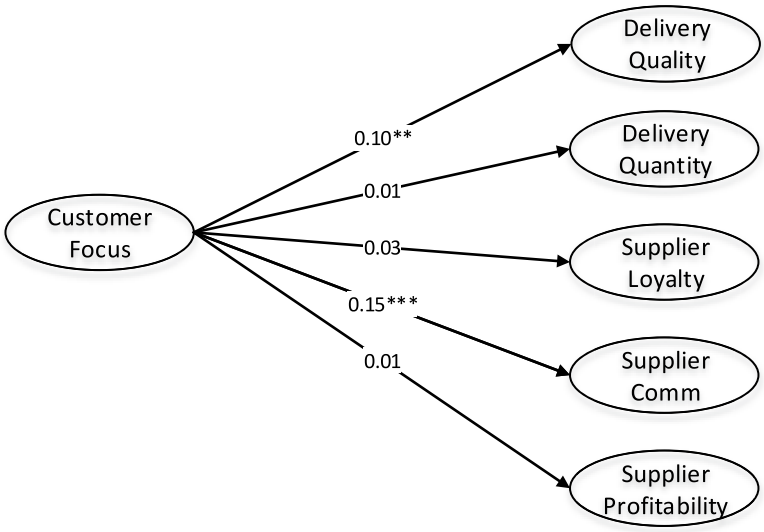

Figure E: 12 Direct effects of customer focus on supplier performance variables (no mediation)

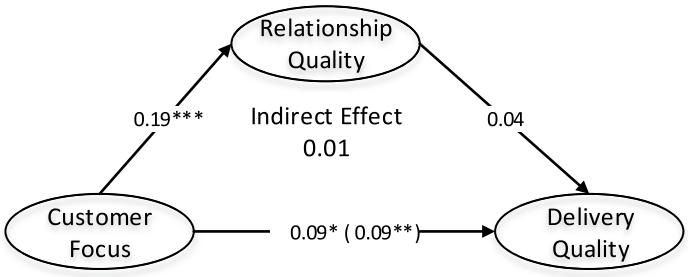

Figure E: 13 Direct and indirect effects of supplier customer focus on delivery quality

Customer focus has a significant positive direct effect on delivery quantity and no significant mediation through relationship quality.

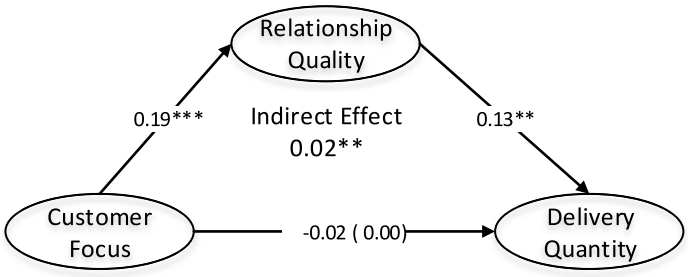

Figure E: 14 Direct and indirect effects of supplier customer focus on delivery quantity

Customer focus affects delivery quantity positively and indirectly through relationship quality. There is no direct effect of supplier customer focus on delivery quality.

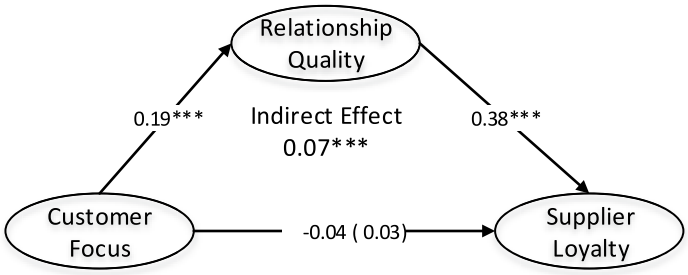

Figure E: 15 Direct and indirect effects of supplier customer focus on supplier loyalty

Supplier net value affects supplier loyalty positively and indirectly through relationship quality. There is no direct effect of supplier customer focus on delivery quality.

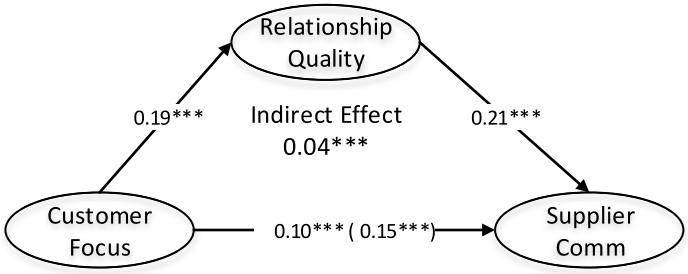

Figure E: 16 Direct and indirect effects of supplier customer focus on supplier communication

Partial Mediation: Relationship quality positively and partially mediates the positive relationship between relationship quality and supplier communication.

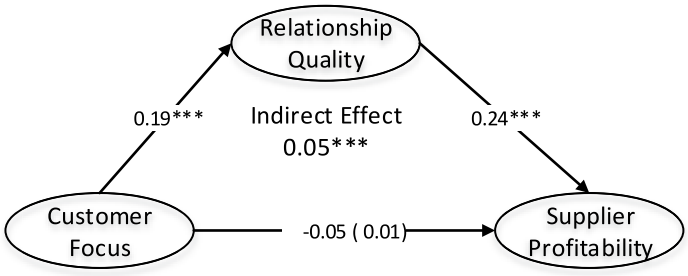

Figure E: 17 Direct and indirect effects of supplier customer focus on supplier profitability

Indirect Effect: Customer focus affects supplier profitability positively and indirectly through Relationship quality. There is no direct effect of supplier net value on delivery quality.

Supplier motivation

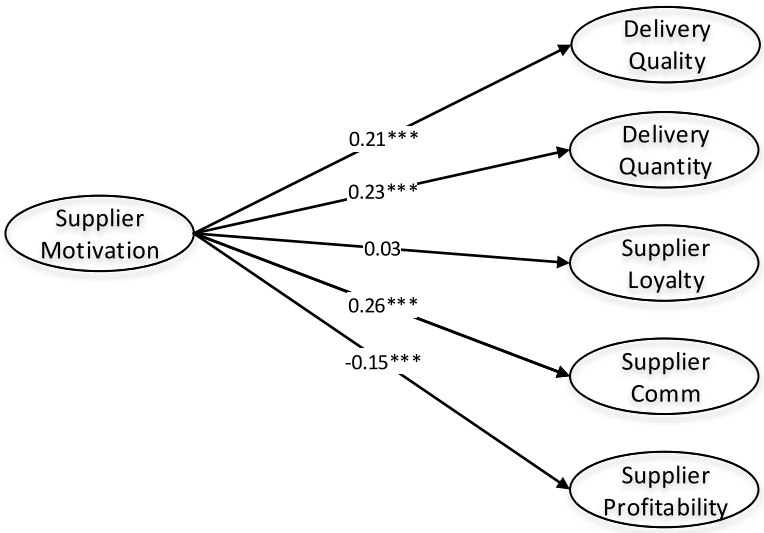

Figure E: 18 Direct effects of supplier motivation on supplier performance variables (no mediation)

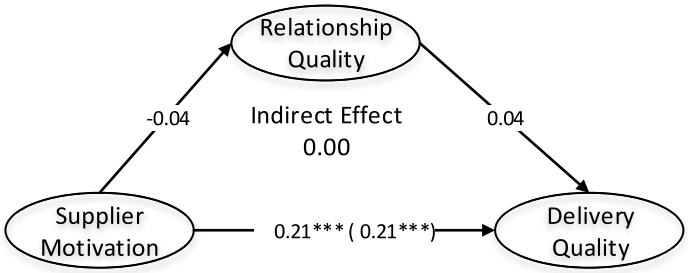

Figure E: 19 Direct and indirect effects of supplier motivation on delivery quality

No Mediation: Supplier motivation has a significant direct effect on delivery quality with no significant mediation through relationship quality.

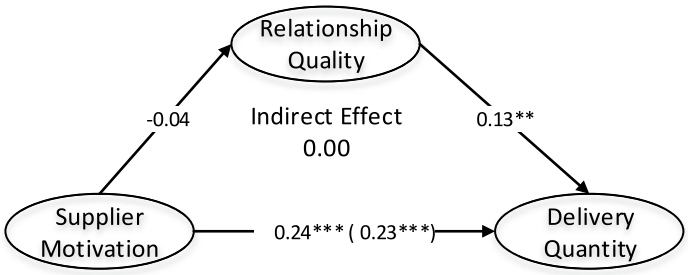

Figure E: 20 Direct and indirect effects of supplier motivation on delivery quantity

No Mediation: Supplier motivation has a significant positive direct effect on delivery quantity and no significant mediation through relationship quality.

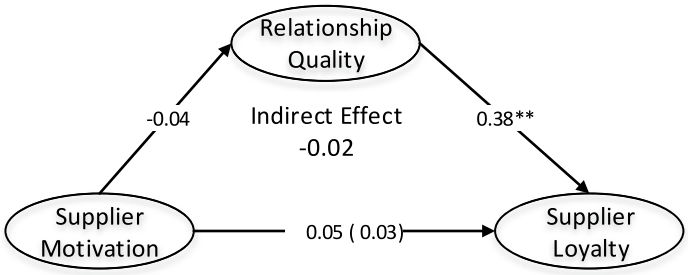

Figure E: 21 Direct and indirect effects of supplier motivation on supplier loyalty

No Effect: There is no significant direct or indirect effect of supplier motivation on Supplier loyalty.

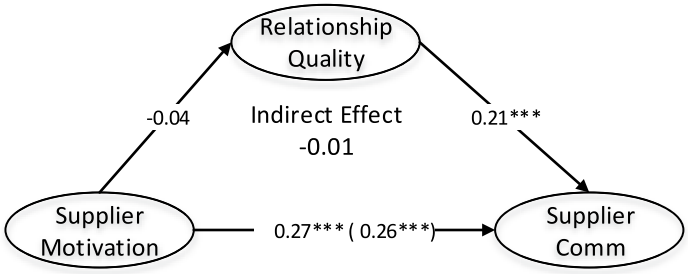

Figure E: 22 Direct and indirect effects of supplier motivation on supplier communication

No Mediation: Supplier motivation has a significant positive direct effect on supplier communication and no significant mediation through relationship quality.

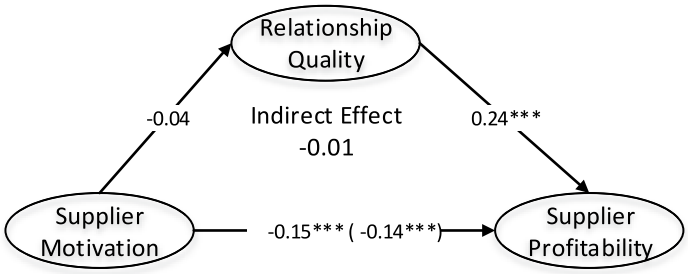

Figure E: 23 Direct and indirect effects of supplier motivation on supplier profitability

No Mediation: Supplier motivation has a significant positive direct effect on supplier profitability and no significant mediation through Relationship quality.

Supplier ability

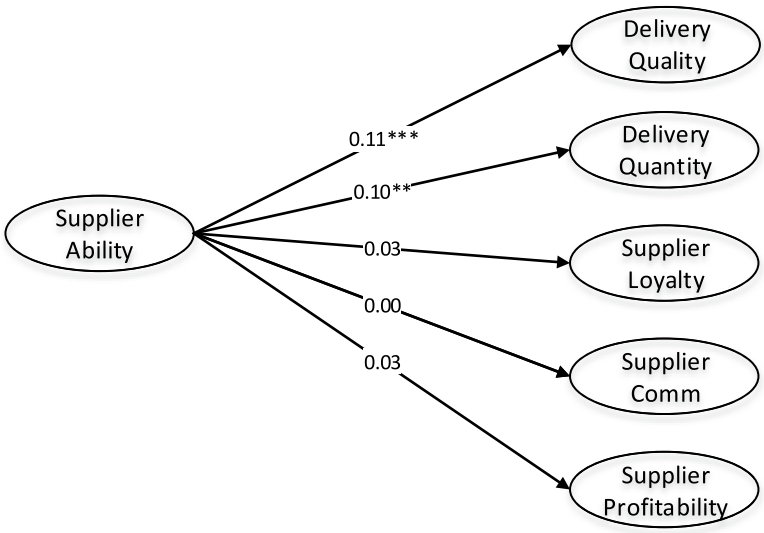

Figure E: 24 Effects of supplier ability on supplier performance

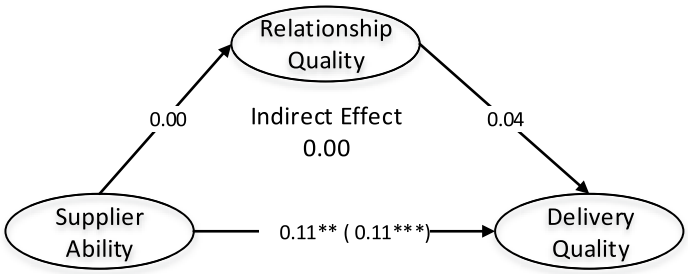

Figure E: 25 Direct and indirect effects of supplier ability on delivery quality

No Mediation: Supplier ability has a significant positive direct effect on delivery quality and no significant mediation through Relationship quality.

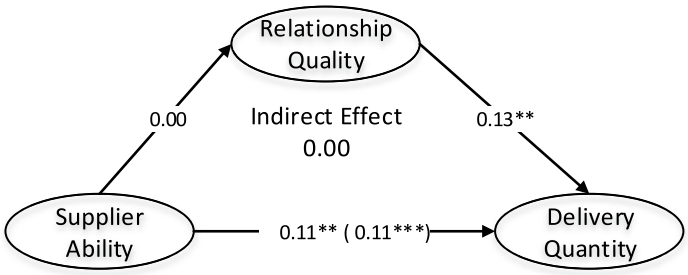

Figure E: 26 Direct and indirect effects of supplier ability on delivery quantity

No Mediation: Supplier ability has a significant positive direct effect on delivery quantity and no significant mediation through Relationship quality.

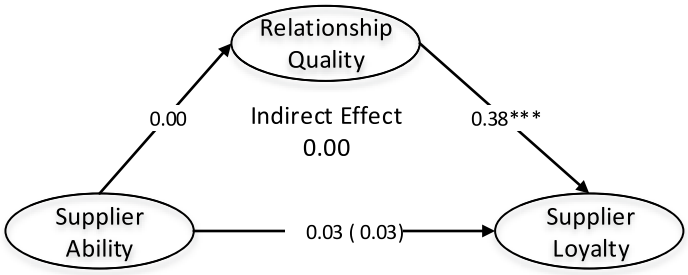

Figure E: 27 Direct and indirect effects of supplier ability on supplier loyalty

There is no significant direct or indirect effect of supplier ability on supplier loyalty.

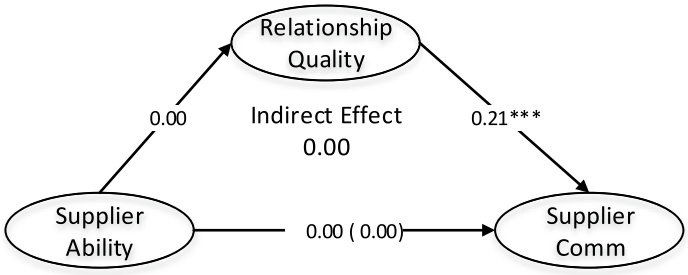

Figure E: 28 Direct and indirect effects of supplier communication

No Effect: There is no significant direct or indirect effect of supplier ability on supplier communication.

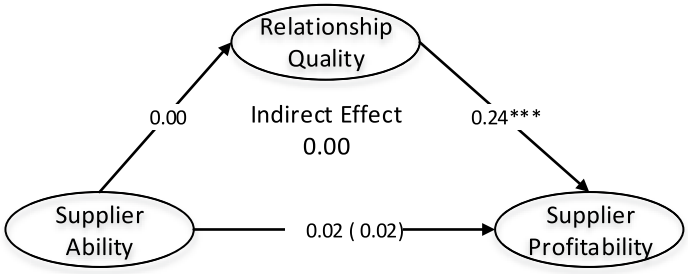

Figure E: 29 Direct and indirect effects of supplier ability on supplier profitability

There is no significant direct or indirect effect of supplier motivation on supplier communication.

Processor dependence

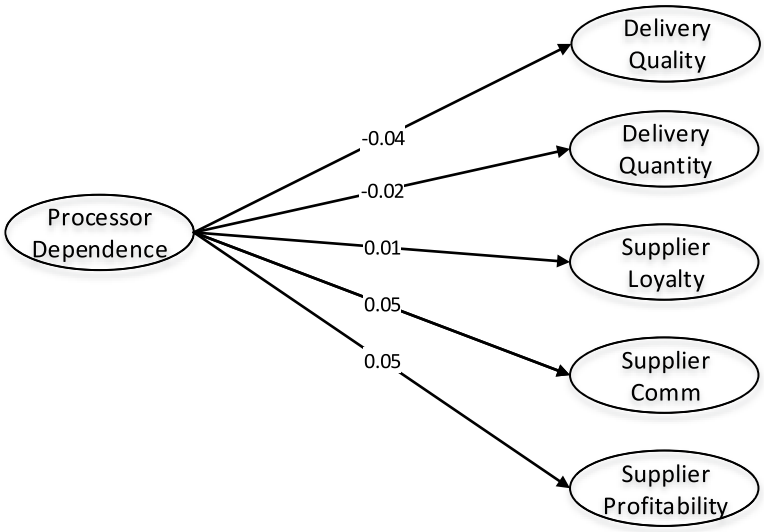

Figure E: 30 Direct effects of processor dependence on supplier performance (no mediation)

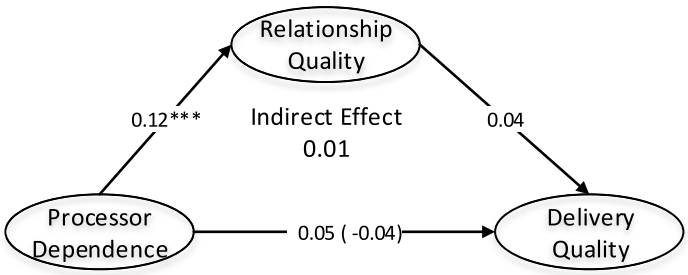

Figure E: 31 Direct and indirect effects of Processor dependence on delivery quality

No Effect: There is no significant direct or indirect effect of Processor dependence on delivery quality.

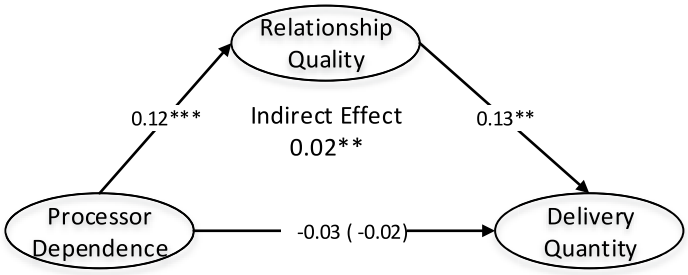

Figure E: 32 Direct and indirect effects of processor dependence on delivery quality

Indirect Effect: Processor dependence affects delivery quantity positively and indirectly through Relationship quality. There is no direct effect of supplier net value on delivery quality.

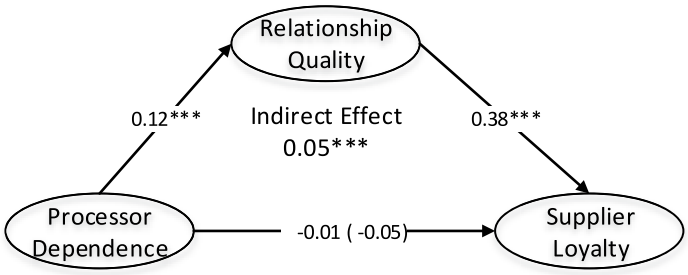

Figure E: 33 Direct and indirect effects of processor dependence on supplier loyalty

Indirect Effect: Processor dependence affects supplier loyalty positively and indirectly through Relationship quality. There is no direct effect of supplier processor dependence on delivery quality.

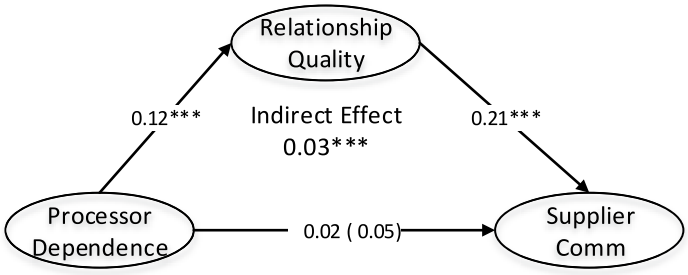

Figure E: 34 Direct and indirect effects of processor dependence on supplier communication

Indirect Effect: Processor dependence affects supplier communication positively and indirectly through Relationship quality. There is no direct effect of supplier communication on delivery quality.

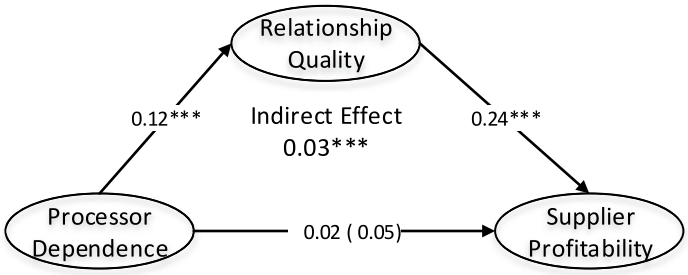

Figure E: 35 Direct and indirect effects of processor dependence on supplier profitability

Indirect Effect: Processor dependence affects supplier profitability positively and indirectly through Relationship quality. There is no direct effect of supplier communication on delivery quality.

Supplier dependence

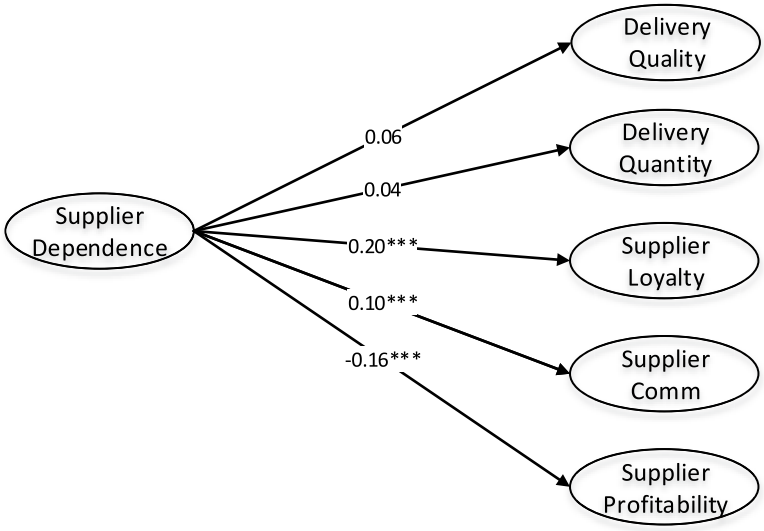

Figure E: 36 Direct effects of supplier dependence on supplier performance (no mediation)

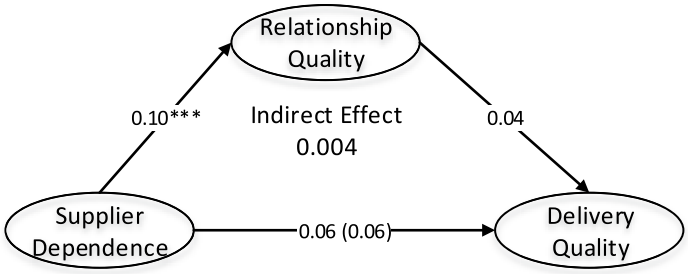

Figure E: 37 Direct and indirect effects of supplier dependence on delivery quality

There is no significant direct or indirect effect of supplier dependence on delivery quantity

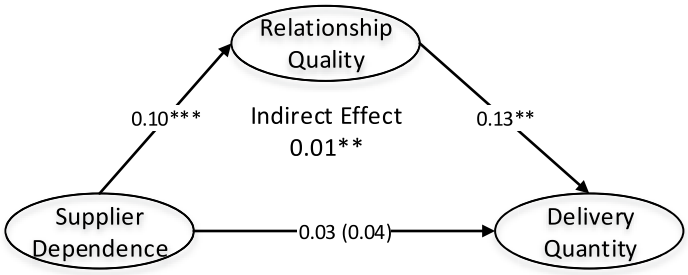

Figure E: 38 Direct and indirect effects of supplier dependence on delivery quantity

Indirect Effect: Supplier dependence affects delivery quantity positively and indirectly through Relationship quality. There is no direct effect of supplier dependence on delivery quantity

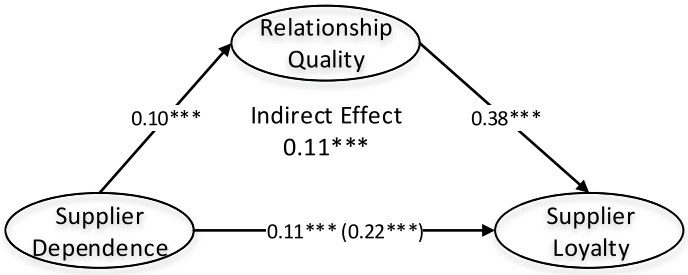

Figure E: 39 Direct and indirect effects of supplier dependence on supplier loyalty

Partial Mediation: Relationship quality positively and partially mediates the negative relationship between supplier dependence and supplier loyalty.

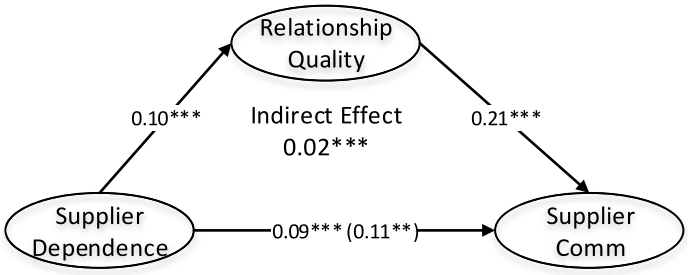

Figure E: 40 Direct and indirect effects of supplier dependence on supplier communication

Partial Mediation: relationship quality positively and partially mediates the negative relationship between supplier dependence and supplier communication.

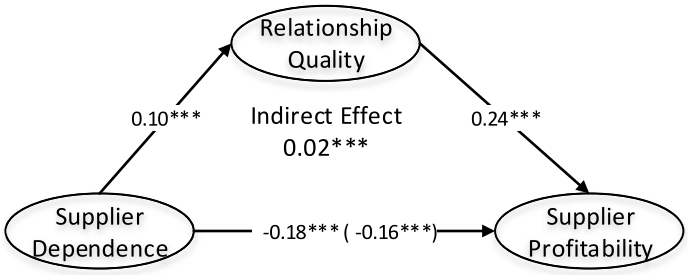

Figure E: 41 Direct and indirect effects of supplier dependence on supplier profitability

Partial Mediation: Relationship quality positively and partially mediates the negative relationship between supplier dependence and supplier profitability.

Specific investments

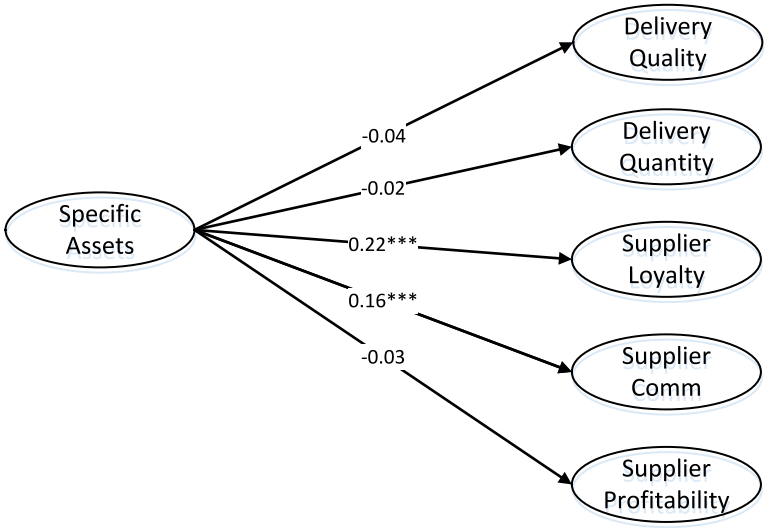

Figure E: 42 Direct effect of specific investments on supplier performance (no mediation)

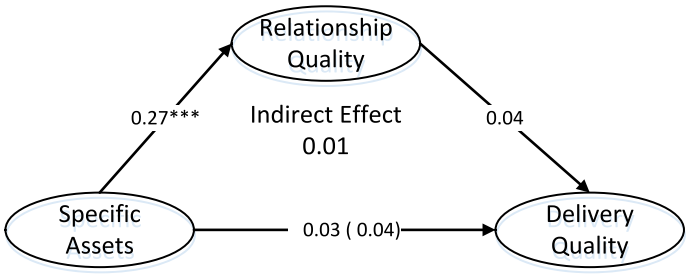

Figure E: 43 Direct and indirect effects of specific investments on delivery quality

No Effect: There is no significant direct or indirect effect of processor dependence on delivery quality.

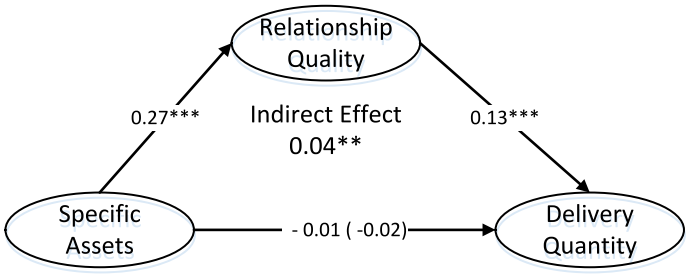

Figure E: 44 Direct and indirect effects of specific investments on delivery quantity

Indirect Effect: Specific investments affect delivery quantity positively and indirectly through Relationship quality. There is no direct effect of specific investments on delivery quality.

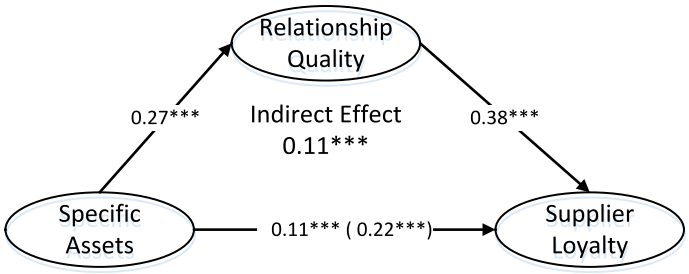

Figure E: 45 Direct and indirect effects of specific investments on supplier loyalty

Partial Mediation: Relationship quality positively and partially mediates the positive relationship between specific investments and supplier loyalty.

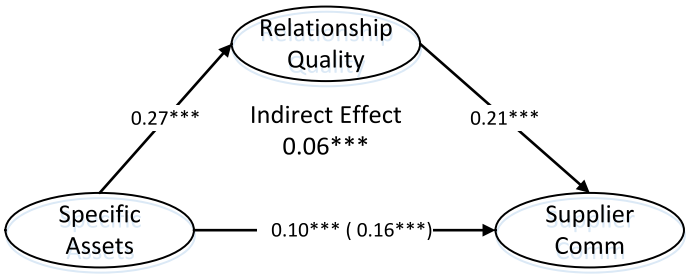

Figure E: 46 Direct and indirect effects of specific investments on supplier communication

Partial Mediation: Relationship quality positively and partially mediates the positive relationship between specific investments and supplier communication.

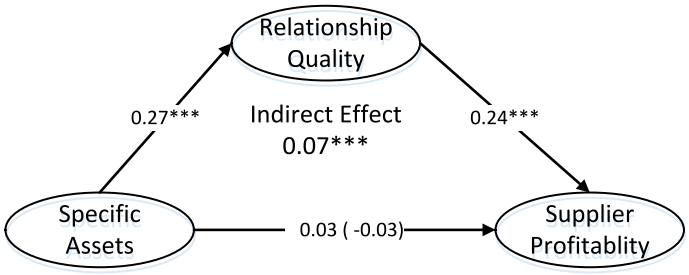

Figure E: 47 Direct and indirect effects of specific investments on supplier profitability

Indirect Effect: Specific investments affect supplier profitability positively and indirectly through Relationship quality. There is no direct effect of specific investments on delivery quality.

Power

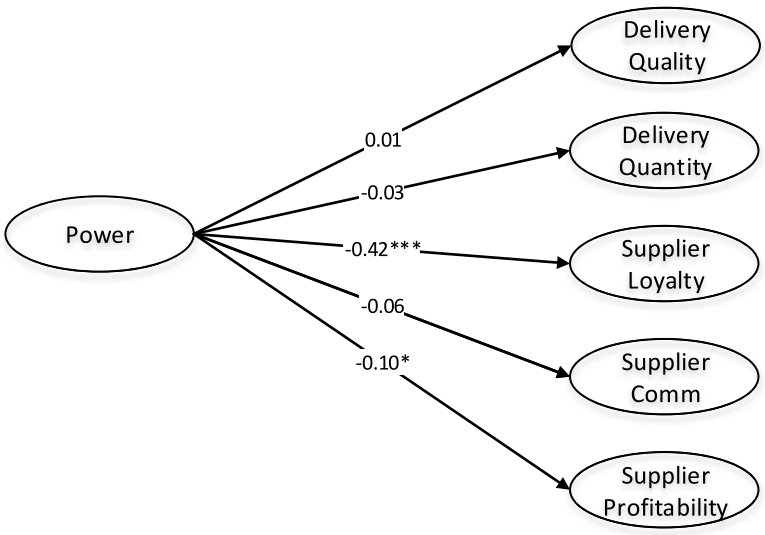

Figure E: 48 Direct effect of Power on supplier performance (no mediation)

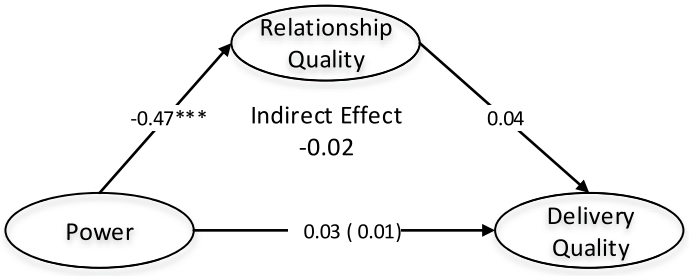

Figure E: 49 Direct and indirect effects of Power on delivery quality

No Effect: There is no significant direct or indirect effect of power on delivery quality.

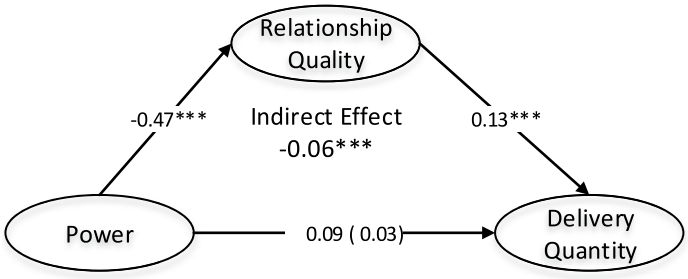

Figure E: 50 Direct and indirect effects of power on delivery quantity

Indirect Effect: Power affects delivery quantity negatively and indirectly through Relationship quality. There is no direct effect of supplier dependence on delivery quantity.

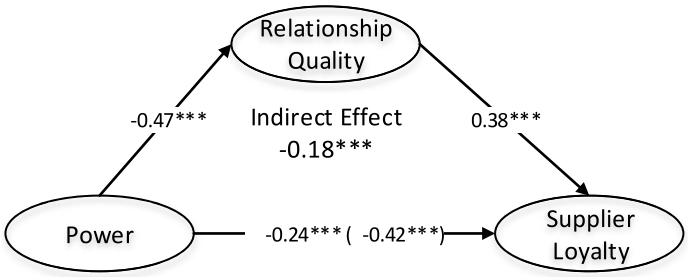

Figure E: 51 Direct and indirect effects of power on Supplier loyalty

Partial Mediation: Relationship quality negatively and partially mediates the negative relationship between power and supplier loyalty.

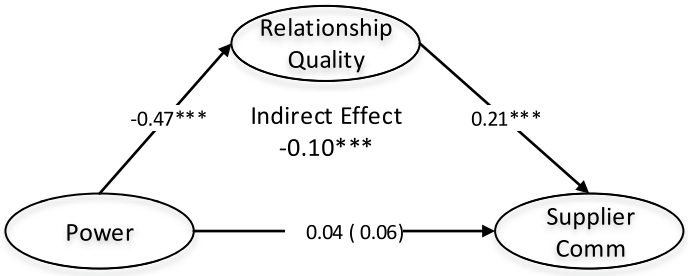

Figure E: 52 Direct and indirect effects of power on supplier communication

Indirect Effect: Power affects supplier communication negatively and indirectly through Relationship quality. There is no direct effect of power on delivery quantity.

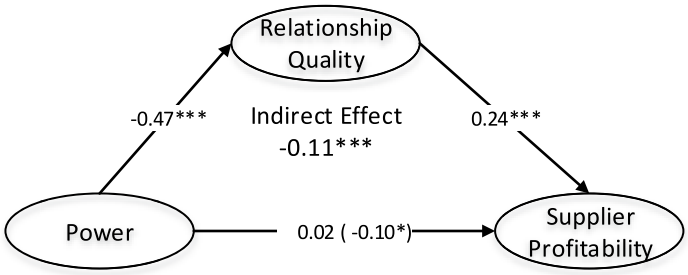

Figure E: 53 Direct and indirect effects of power on supplier profitability

Full Mediation: Relationship quality negatively and fully mediates the positive relationship between power and supplier profitability.

Table E: 16 Standardised regression weights – Re-specified model

Variables			Regression weights	P
Relationship quality	<---	ProcDepend	0.12	***
Relationship quality	<---	SuppNetValue	0.46	***
Relationship quality	<---	Uncertainty	0.05	0.02
Relationship quality	<---	ProcDepend	-0.47	***
Relationship quality	<---	CustomerFocus	0.19	***
Relationship quality	<---	SupplierProfit	-0.04	0.058
Relationship quality	<---	SupplierDepend	0.10	***
Relationship quality	<---	SpecificInvest	0.27	***
SupplierComm	<---	SpecificInvest	0.13	***
SuppLoyalty	<---	SpecificInvest	0.10	0.011
SuppLoyalty	<---	ProcDepend	-0.26	***
DeliveryQuant	<---	SuppNetValue	0.00	0.911
SupplierComm	<---	SuppNetValue	0.12	***
SuppLoyalty	<---	SuppNetValue	0.15	***
SupplierProfit	<---	SuppNetValue	0.13	***
DeliveryQual	<---	SupplierProfit	0.22	***
DeliveryQuant	<---	SupplierProfit	0.24	***
SupplierComm	<---	SupplierProfit	0.27	***
SupplierProfit	<---	SupplierProfit	-0.15	***
DeliveryQual	<---	CustomerFocus	0.11	***
SupplierComm	<---	CustomerFocus	0.11	***
DeliveryQual	<---	SelfDirect	-0.19	***
DeliveryQuant	<---	SelfDirect	-0.13	***
SuppLoyalty	<---	SelfDirect	0.09	***
SupplierProfit	<---	SelfDirect	0.17	***
SupplierComm	<---	SupplierDepend	0.09	0.006
DeliveryQual	<---	SupplierAbility	0.11	0.004
DeliveryQuant	<---	SupplierAbility	0.10	0.006
DeliveryQuant	<---	RQ	0.08	0.026
SupplierComm	<---	RQ	0.20	***
SuppLoyalty	<---	RQ	0.35	***
SupplierProfit	<---	RQ	0.22	***
SupplierProfit	<---	SupplierDepend	-0.20	***
SuppLoyalty	<---	SupplierDepend	0.17	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 17 Correlations between variables - Respecified model: Standardised regression weights

Variables			Regression weights	P
CustomerFocus	←>	SelfDirect	-0.03	0.371
CustomerFocus	←>	SupplierProfit	0.42	***
SelfDirect	←>	SupplierProfit	-0.14	***
SupplierProfit	←>	SuppNetValue	0.13	***
SupplierProfit	<-->	ProcDepend	0.06	0.059
SupplierProfit	<-->	SpecificInvest	0.19	***
CustomerFocus	<-->	SuppNetValue	0.13	***
CustomerFocus	<-->	ProcDepend	0.18	***
CustomerFocus	<-->	SpecificInvest	0.36	***
SelfDirect	<-->	SuppNetValue	0.22	***
SelfDirect	<-->	ProcDepend	-0.20	***
SelfDirect	<-->	SpecificInvest	-0.10	0.001
ProcDepend	<-->	SpecificInvest	0.68	***
SuppNetValue	<-->	ProcDepend	-0.38	***
SpecificInvest	<-->	ProcDepend	0.35	***
ProcDepend	<-->	ProcDepend	0.23	***
SuppNetValue	<-->	ProcDepend	0.03	0.321
SupplierProfit	<-->	ProcDepend	0.14	***
CustomerFocus	<-->	ProcDepend	0.17	***
SelfDirect	<-->	ProcDepend	-0.09	0.003

Variables			Regression weights	P
ProcDepend	←>	SupplierDepend	0.11	***
SpecificInvest	←>	SupplierDepend	0.47	***
ProcDepend	←>	SupplierDepend	0.28	***
SuppNetValue	←>	SupplierDepend	0.11	***
SupplierProfit	<-->	SupplierDepend	0.13	***
CustomerFocus	<-->	SupplierDepend	0.11	***
SelfDirect	<-->	SupplierDepend	-0.18	***
ProcDepend	<-->	SupplierAbility	0.03	0.393
SpecificInvest	<-->	SupplierAbility	0.13	***
ProcDepend	<-->	SupplierAbility	0.13	***
SupplierDepend	<-->	SupplierAbility	0.02	0.636
SelfDirect	<-->	SupplierAbility	0.03	0.414
CustomerFocus	<-->	SupplierAbility	0.26	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 18 Relationship between controls and model variables: Standardised regression weights

Variables			Regression weights	P
SupplierAbility	<-->	EducationMax	0.12	***
SupplierProfit	<-->	EducationMax	0.09	0.003
Clim_SPRG	<-->	Clim_SUM	-0.20	***
Clim_SPRG	<-->	Farm_Size	-0.06	0.036
Clim_SPRG	<-->	Clim_WINT	0.47	***
Soil_Fert	<-->	Clim_WINT	0.03	0.327
Clim_SUM	<-->	Clim_WINT	-0.11	***
EducationMax	<-->	Yrs_Age	-0.28	***
Yrs_Age	<-->	RiskDbtServ	-0.04	0.237
SupplierDepend	<-->	RiskDbtServ	-0.03	0.278
SpecificInvest	<-->	RiskDbtServ	-0.03	0.287
ProcDepend	<-->	RiskDbtServ	-0.07	0.025
SuppNetValue	<-->	RiskDbtServ	0.05	0.082
CustomerFocus	<-->	Yrs_Age	0.05	0.094
SelfDirect	<-->	Yrs_Age	0.01	0.81
SupplierProfit	<-->	Yrs_Age	-0.09	0.003
SupplierAbility	<-->	Yrs_Age	-0.11	***

Variables			Regression weights	P
SelfDirect	<-->	Uncertainty	-0.08	0.015
CustomerFocus	<-->	Uncertainty	0.16	***
SupplierProfit	<-->	Uncertainty	0.08	0.002
ProcDepend	<-->	Uncertainty	0.09	0.002
SpecificInvest	<-->	Uncertainty	0.10	***
ProcDepend	<-->	Uncertainty	0.11	***
SelfDirect	<-->	UncertProd	0.12	***
CustomerFocus	<-->	UncertProd	0.07	0.018
SupplierProfit	<-->	UncertProd	0.10	0.002
SupplierAbility	<-->	UncertProd	0.13	***
SuppNetValue	<-->	UncertProd1	0.12	***
ProcDepend	<-->	Farm_Size	0.07	0.004
SuppNetValue	<-->	Farm_Size	-0.07	0.026
SuppNetValue	<-->	SupplierAbility	0.11	***
SupplierProfit	<-->	SupplierAbility	0.59	***

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Table E: 19 Standardised regression weights – Control variables: Standardised regression weights

			Estimate	P
SupplierProfit	<---	Clim_SPRG	0.11	***
SupplierProfit	<---	Clim_SUM	-0.04	0.221
SupplierProfit	<---	Farm Size	0.07	0.011
DeliveryQuant	<---	Farm Size	0.04	0.175
DeliveryQual	<---	Farm Size	-0.05	0.088
SupplierComm	<---	Shares_Yes_No	-0.06	0.018
SuppLoyalty	<---	Shares_Yes_No	-0.21	***
SupplierProfit	<---	EducationMax	-0.09	0.001
SupplierProfit	<---	Soil_Fert	0.06	0.03
SupplierProfit	<---	Clim_WINT	-0.02	0.535
DeliveryQuant	<---	UncertProd	0.11	***
DeliveryQual	<---	UncertProd	0.09	0.003

Significance levels: p<0.001 ***, p<0.05 **, p<0.10 *

Appendix F - Full respecified model

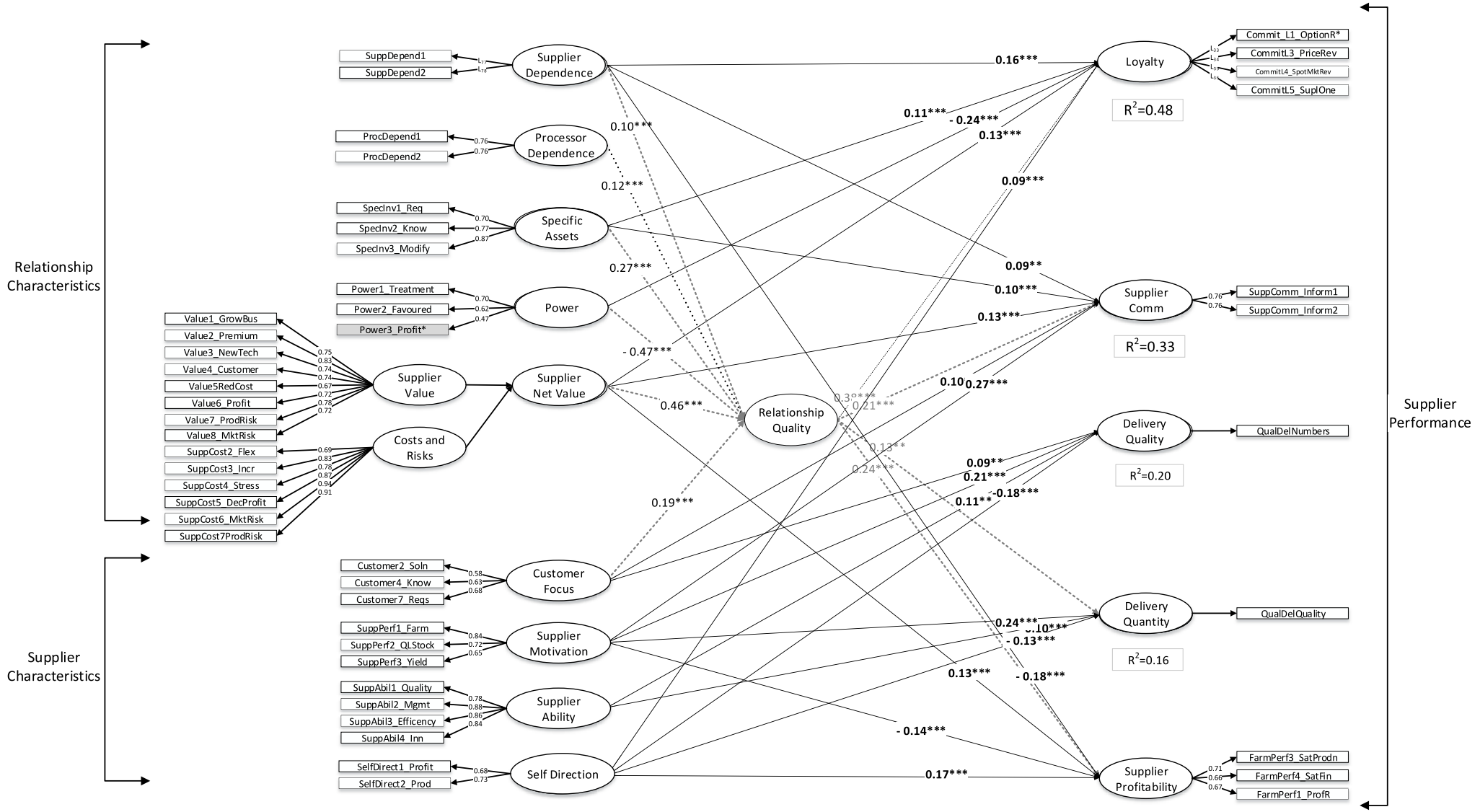

Figure F: 1 Diagram showing full respecified model including scale items and factor loadings.

Appendix G - Survey questionnaires

Table G: 1 Survey Questionnaire – Sheep industry

Section A: Relationship with Lamb Processor

(By lamb processor we mean the processor or cooperative/company that you sell your lambs to. This may be the processor and/or exporter and marketer of your lamb)

You only need to complete the survey if you supply a significant number of lambs to a processor

	Please indicate how much do you agree or disagree with the following statements. **Regarding your current lamb processor:**	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	We expect our relationship with our current lamb processor to continue for a long time	❍	❍	❍	❍	❍	❍
2	We are willing to dedicate time, effort and resources to support our current lamb processor in growing their markets and sales	❍	❍	❍	❍	❍	❍
3	We are proud to tell other farmers that we are a supplier to our current lamb processor	❍	❍	❍	❍	❍	❍
4	We are willing to make long term investments and changes to our farm to better meet the requirements of our current lamb processor and their customers	❍	❍	❍	❍	❍	❍
5	We help out our current lamb processor in whatever ways they ask	❍	❍	❍	❍	❍	❍
6	Even if our current lamb processor gives us a rather unlikely explanation we are confident that they are telling the truth	❍	❍	❍	❍	❍	❍
7	When making important decisions, our current lamb processor is always concerned about our welfare	❍	❍	❍	❍	❍	❍
8	We can rely on our current lamb processor to help us in ways not required by our agreement with them	❍	❍	❍	❍	❍	❍
9	We believe that our current lamb processor will always treat us fairly	❍	❍	❍	❍	❍	❍
10	We can rely on our current lamb processor without any fear they will take advantage of us even if the opportunity arises	❍	❍	❍	❍	❍	❍
11	We can rely on our current lamb processor to always deliver the best returns from the market	❍	❍	❍	❍	❍	❍
12	The business outcomes achieved by supplying our current lamb processor are more attractive than those of other competing companies we have supplied or could supply	❍	❍	❍	❍	❍	❍
The relationship with your current lamb processor could be characterised as:							
13	Having compatible goals and objectives	❍	❍	❍	❍	❍	❍
14	Having similar values	❍	❍	❍	❍	❍	❍
15	Involving a close personal interaction between both parties	❍	❍	❍	❍	❍	❍
16	Having strong mutual trust between both parties	❍	❍	❍	❍	❍	❍
17	Involving personal friendship between both parties	❍	❍	❍	❍	❍	❍
18	Involving give and take (reciprocity) between both parties	❍	❍	❍	❍	❍	❍
19	Involving strong personal bonds	❍	❍	❍	❍	❍	❍
Regarding your current lamb processor							
20	Communications from our lamb processor are open and honest	❍	❍	❍	❍	❍	❍
21	I feel informed about the organisation and the activities of our current lamb processor	❍	❍	❍	❍	❍	❍
22	The costs and risks involved in supplying our current lamb processor are greater than the benefits	❍	❍	❍	❍	❍	❍
Our current lamb processor and ourselves try to promote:							
23	Frequent and intensive interaction between both parties	❍	❍	❍	❍	❍	❍
24	Interaction between different **levels** of staff in both businesses (management, field staff etc)	❍	❍	❍	❍	❍	❍
25	Interaction between different **functions** of staff in both businesses (technical, admin, marketing etc)	❍	❍	❍	❍	❍	❍

	Compared to alternatives, we have experienced the following <u>disadvantages</u> from supplying our current lamb processor:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	Reduced flexibility in our farming operation	❍	❍	❍	❍	❍	❍
2	Increased production costs	❍	❍	❍	❍	❍	❍
3	Extra management effort and stress	❍	❍	❍	❍	❍	❍
4	Reduced farm profitability	❍	❍	❍	❍	❍	❍
5	Increased production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
6	Increased market risk involved in selling our cattle (price uncertainty)	❍	❍	❍	❍	❍	❍
Regarding your current lamb processor							
7	As a business we feel very dependent on our current lamb processor	❍	❍	❍	❍	❍	❍
8	We have made significant investments in our farm business in order to specifically meet the requirements of our current lamb processor and their customers.	❍	❍	❍	❍	❍	❍
9	Our current lamb processor is more dependent on us than we are on them	❍	❍	❍	❍	❍	❍
10	There has been a significant amount of specific knowledge we have had to learn in order to specifically meet the requirements of supplying our current lamb processor.	❍	❍	❍	❍	❍	❍
11	We have made significant modifications to our farming system specifically to meet the requirements of supplying our current lamb processor.	❍	❍	❍	❍	❍	❍
12	We are very dependent on our current lamb processor.	❍	❍	❍	❍	❍	❍
13	If we did not do what our current lamb processor asked we would not have received very good treatment from them	❍	❍	❍	❍	❍	❍
14	We have felt that by going along with what our current lamb processor asked, we would be favoured on other occasions	❍	❍	❍	❍	❍	❍
15	Our current lamb processor has hinted that they would take certain action that would affect our profitability if we did not go along with their requests	❍	❍	❍	❍	❍	❍
16	Our current lamb processor is very dependent on us.	❍	❍	❍	❍	❍	❍
Regarding your communication with your current lamb processor:							
17	We always let our current lamb processor know as soon as possible of any unexpected problems with things such as delivery, or product quality	❍	❍	❍	❍	❍	❍
18	Keeping our current lamb processor informed on our production plans is very important to us	❍	❍	❍	❍	❍	❍
Compared to alternative options, supplying our current lamb processor has enabled us to:							
19	Grow our farming business	❍	❍	❍	❍	❍	❍
20	Access premium markets for our farm products	❍	❍	❍	❍	❍	❍
21	Adopt new technologies into our farming system (genetics, crops etc.)	❍	❍	❍	❍	❍	❍
22	Adapt our production to meet the requirements of customers for our products	❍	❍	❍	❍	❍	❍
23	Reduce our costs of production	❍	❍	❍	❍	❍	❍
24	Increase our farm profitability	❍	❍	❍	❍	❍	❍
25	Reduce the production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
26	Reduce the market risk involved in selling our lamb (price uncertainty)	❍	❍	❍	❍	❍	❍
Regarding the relationship with your current lamb processor							
27	If our current livestock buyer moved to another lamb processor we would change also	❍	❍	❍	❍	❍	❍
28	The commitment we have to our livestock buyer is more important than the commitment to our current lamb processor	❍	❍	❍	❍	❍	❍

Regarding the international market for lamb:		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	The nature of competition in the international market for lamb is intense	❍	❍	❍	❍	❍	❍
2	There are rapid changes in consumer needs and preferences for lamb	❍	❍	❍	❍	❍	❍
3	The market price for New Zealand lamb on the international market is highly volatile	❍	❍	❍	❍	❍	❍
Regarding the performance of your sheep operation							
4	The profitability of our sheep operation was not satisfactory last year	❍	❍	❍	❍	❍	❍
5	We were very satisfied with the overall financial performance of our sheep operation last year	❍	❍	❍	❍	❍	❍
6	We were very satisfied with the overall production of our sheep operation last year	❍	❍	❍	❍	❍	❍
7	We were very satisfied with the price we received for our stock last year	❍	❍	❍	❍	❍	❍

Subscript

Section B: You and your farm business

Regarding yourself and your farm business:		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	As a farm business we try to conduct business on as long term basis as possible	❍	❍	❍	❍	❍	❍
2	As a farm business, we try to remain as independent as possible	❍	❍	❍	❍	❍	❍
3	We are committed to farming sheep for the long term	❍	❍	❍	❍	❍	❍
4	We always target premiums for producing to the preferred weights and grades	❍	❍	❍	❍	❍	❍
5	We would aim to produce the best quality stock even if we were not able to get a premium	❍	❍	❍	❍	❍	❍
6	We are always wary of becoming too locked in to one processor that buys our stock	❍	❍	❍	❍	❍	❍
7	We make long term plans for the future of our farm business	❍	❍	❍	❍	❍	❍
8	It is important to us to be committed to one processor to supply our stock	❍	❍	❍	❍	❍	❍
9	We have made significant changes to our farming operation to better meet customer requirements	❍	❍	❍	❍	❍	❍
10	It is important for us to know who the customer of our product is	❍	❍	❍	❍	❍	❍
11	I like to work as part of a team	❍	❍	❍	❍	❍	❍
12	It is important to us to have more than one option to sell our stock	❍	❍	❍	❍	❍	❍
13	If the price was good it doesn't matter who we supply our stock to	❍	❍	❍	❍	❍	❍
14	We will always get better prices over the season if we play the market	❍	❍	❍	❍	❍	❍
15	Reducing the costs on our farm is the most important thing to us	❍	❍	❍	❍	❍	❍
16	It doesn't matter to me who the final consumer of my product is as long as I get the best price	❍	❍	❍	❍	❍	❍
17	We seem to have the ability to know how to buy and sell stock to get the best price from the market	❍	❍	❍	❍	❍	❍
18	There is little room to make improvements in our farm operation due to natural production constraints	❍	❍	❍	❍	❍	❍
19	I can't worry too much about marketing because my main concern is with production on my farm	❍	❍	❍	❍	❍	❍
20	Our farm business operates in a market where above average quality is important	❍	❍	❍	❍	❍	❍
21	The main things that affect our farm profitability are outside of my control (e.g. weather, price)	❍	❍	❍	❍	❍	❍
22	We are always looking for ways to differentiate our farm products and to gain a premium price	❍	❍	❍	❍	❍	❍

	Regarding yourself and your farm business:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
23	We are willing to modify our farming practices to meet customer needs even if it increases our costs	❍	❍	❍	❍	❍	❍
24	The main benefit from owning shares in a lamb processor is to ensure you are treated fairly	❍	❍	❍	❍	❍	❍
25	The years when the farm has shown poor production or profit have been due to circumstance totally out of my control	❍	❍	❍	❍	❍	❍
26	Constantly expanding the size of the farm business is absolutely necessary to remain profitable	❍	❍	❍	❍	❍	❍
27	I like to find solutions to problems so that everyone comes out ahead	❍	❍	❍	❍	❍	❍
28	It is usually foolish to try and help other people to be successful	❍	❍	❍	❍	❍	❍
29	I value cooperation over competition	❍	❍	❍	❍	❍	❍
30	I always like to work for the good of the whole group rather than for my own individual benefit	❍	❍	❍	❍	❍	❍
31	We continually try to understand the needs of our customers even ones of which they are not yet aware	❍	❍	❍	❍	❍	❍
32	We try to incorporate solutions to future customer needs into our farming operation	❍	❍	❍	❍	❍	❍
33	We try to understand customers and to recognise their needs months or even years before the majority of the market may recognise them	❍	❍	❍	❍	❍	❍
34	We always deliver the quality of animals our current lamb processor requires	❍	❍	❍	❍	❍	❍
35	We always deliver the number of animals we agree to supply to our current lamb processor	❍	❍	❍	❍	❍	❍
36	We always try to collaborate and work with other suppliers to improve the overall performance of all suppliers	❍	❍	❍	❍	❍	❍
37	I would take steps to improve the environmental sustainability of our farm even if it was not important to customers	❍	❍	❍	❍	❍	❍
38	We continually try to improve our farm performance by improving output (animal production)	❍	❍	❍	❍	❍	❍
39	We have consistently managed to improve our farm efficiency	❍	❍	❍	❍	❍	❍
40	Being able to compare our farm production data with other lamb producers is essential for us to improve performance	❍	❍	❍	❍	❍	❍
41	We continually try to improve our farm performance by lowering our costs of production	❍	❍	❍	❍	❍	❍
42	I avoid trying out new ideas in case they don't work	❍	❍	❍	❍	❍	❍
43	We continually strive to improve the quality of our stock	❍	❍	❍	❍	❍	❍
44	We are always looking for innovative ways to market our products	❍	❍	❍	❍	❍	❍
45	I would take steps to improve animal welfare even if it wasn't important to our customers	❍	❍	❍	❍	❍	❍
46	I seldom seek innovative ideas	❍	❍	❍	❍	❍	❍
47	We continually strive to improve our farm performance	❍	❍	❍	❍	❍	❍
48	Innovation is readily accepted in all aspects of our management	❍	❍	❍	❍	❍	❍
49	We continually try to improve our farm performance by achieving higher market returns for our products	❍	❍	❍	❍	❍	❍
50	Technical innovation based on research results are readily accepted in our farm operation	❍	❍	❍	❍	❍	❍
51	Innovation in our farm business is perceived as too risky and is resisted	❍	❍	❍	❍	❍	❍
52	I am generally a person who is fully prepared to take risks	❍	❍	❍	❍	❍	❍
53	I am always one of the first in the district to try something new	❍	❍	❍	❍	❍	❍

Please rate the relationship with your current lamb processor on the following aspects:		Poor	Somewhat Poor	Average	Somewhat Good	Good	Very Good
1	Our trust in our current lamb processor is ...	❍	❍	❍	❍	❍	❍
2	Our commitment towards our current lamb processor is ...	❍	❍	❍	❍	❍	❍
3	Our satisfaction with our current lamb processor is ...	❍	❍	❍	❍	❍	❍
4	Our collaboration with our current lamb processor in the past has been ...	❍	❍	❍	❍	❍	❍

How does your current lamb processor compare on the following aspects with competing/alternative companies that you could supply?		Much Worse	Worse	Somewhat Worse	Somewhat Better	Better	Much Better
1	Their marketing and sales skills.	❍	❍	❍	❍	❍	❍
2	Their skills for improving quality and efficiency in the supply chain.	❍	❍	❍	❍	❍	❍
3	Their ability to get a premium price from the market	❍	❍	❍	❍	❍	❍
4	Net return to supplying stock	❍	❍	❍	❍	❍	❍
5	Support services provided	❍	❍	❍	❍	❍	❍
6	Having reasonable policies	❍	❍	❍	❍	❍	❍

Please indicate your level of satisfaction with your current lamb processor in relation to:		Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
1	The price received for the animals you supply	❍	❍	❍	❍	❍	❍
2	The seasonal structure of the pricing schedule	❍	❍	❍	❍	❍	❍
3	The support provided by the stock buyer/supply manager	❍	❍	❍	❍	❍	❍
4	The quantity (amount, frequency) of communication	❍	❍	❍	❍	❍	❍
5	The timeliness of communication	❍	❍	❍	❍	❍	❍

How important to you are the following:		Not at all Important	Somewhat	Somewhat Important	Very Important	Extremely Important
1	Achieving a premium price for my stock	❍	❍	❍	❍	❍
2	Benchmarking farm performance with other suppliers	❍	❍	❍	❍	❍
3	Social interaction with other suppliers	❍	❍	❍	❍	❍
4	Having processing space available at the right time (as determined by feed supply)	❍	❍	❍	❍	❍
5	Knowing the price I will receive for stock well ahead of time (price certainty)	❍	❍	❍	❍	❍
6	Being a highly profitable farmer to your sense of self-identity (i.e., your sense of who you are)?	❍	❍	❍	❍	❍
7	Being a farmer who takes good care of the environment to your sense of self-identity	❍	❍	❍	❍	❍

Section C

1. How often would you have contact with someone from your current lamb processor?

	By Phone, Email or Text	Face to Face
Less than once every 3 months	❍	❍
Once every 3 months	❍	❍
Less than Once a Month	❍	❍
Once a Month	❍	❍
2-3 Times a Month	❍	❍
Once a Week	❍	❍
2-3 Times a Week	❍	❍
	❍	❍

2. Please indicate how you would react if one of your current lamb processor competitors consistently offered a higher price for animals of equal quality/specifications?

- ❍ Switch to competitor as soon as technically feasible;
- ❍ Switch at end of contract
- ❍ Reduce the amount you supply to your current lamb processor
- ❍ Continue to supply your current lamb processor and support them to match the competitor's performance
- ❍ A competitors price would have no influence on our commitment to our current lamb processor

3. How many other lamb processors are there in your area that you could potentially supply your lamb to? _____

4. Approximately what % of your total farm income comes from sales to your current lamb processor? _____%
(Including other stock e.g. beef)

5. How would you rate the actual returns you achieve from supplying your current lamb processor, compared to what you would expect to achieve for your animals?

- ❍ Far short of expectations
- ❍ Short of expectations
- ❍ Equals expectations
- ❍ Exceeds expectations
- ❍ Far exceeds expectations

	Please indicate how you would rate yourself on the following compared to other sheep farmers in New Zealand	Below Average	Average	Above Average	Significantly above average	Top 25%	Top 10%	Top 5%
1	Your ability to deliver the numbers of quality stock when required	❍	❍	❍	❍	❍	❍	❍
2	Your ability to implement innovation and new technology on your farm	❍	❍	❍	❍	❍	❍	❍
3	Your ability to reduce production costs and increase farm efficiency	❍	❍	❍	❍	❍	❍	❍
4	Your overall farm management skills	❍	❍	❍	❍	❍	❍	❍

Compared to other sheep farmers how would you evaluate:		Much Lower	Slightly Lower	About the Same	Higher	Much Higher
1	The profitability of your sheep operation over the last 3 years?	❍	❍	❍	❍	❍
2	The price received for your lamb over the last 3 years?	❍	❍	❍	❍	❍
In your sheep production system, how much certainty is there regarding:		**Fairly certain**	**Somewhat certain**	**Uncertain**	**Very uncertain**	**Extremely uncertain**
1	The numbers and weight of the animals you can supply to your lamb processor if planning for delivery in 8 months' ahead?	❍	❍	❍	❍	❍
2	Your production costs over 3 years?	❍	❍	❍	❍	❍

1. Please indicate your gender.

❍ Male
❍ Female

2. What statement best describes you?
❍ Farm owner and manager
❍ Farm owner
❍ Farm manager
❍ Other (please state): _____

3. Which of the following best describes the ownership of your farm?
❍ Corporate farm
❍ Family farm
❍ Maori trust/corporation
❍ Other (please state) _____

4. Please indicate how much influence do you have in the decision making on the farm?		None	Little	Some	A Lot	Most	Nearly All	All
1	For day to day (operational) management decisions	❍	❍	❍	❍	❍	❍	❍
2	For long term strategic decisions	❍	❍	❍	❍	❍	❍	❍

5. How many years have you supplied your current lamb processor? (or the same company under previous name)

❍ Less than 1 year
❍ 1 year
❍ 2 years
❍ 3 years
❍ 4 years
❍ 5 - 10 years
❍ 10 – 20 years
❍ 20 +

6. Is your farm business a shareholder in your current lamb processor?

- ❍ Yes
- ❍ No (go to question 9)

7. How many years has your farm business been a shareholder of your current lamb processor?
(or the same company under previous name)

- ❍ Less than 1 year
- ❍ 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 - 10 years
- ❍ 10 – 20 years
- ❍ 20 +

8. Owning shares in our lamb processor means we can influence the decisions they make that affect our farm business
(answer if a shareholder)

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

9. In the last year have you supplied lamb on contract (with quality and/or delivery specifications) to your current lamb processor?

- ❍ Yes
- ❍ No (go to question 12)

10. What % of your total lamb sales were supplied on contract? _____%

11. For how many years have you supplied lamb on contract to your current lamb processor?

- ❍ Do not supply on contract
- ❍ 0 - 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years +

12. Which lamb company do you supply your lambs to? (Select the one you supply most of your lambs to)

❍ Silver Fern Farms ❍ Alliance Group ❍ CMP/Riverlands (ANZCO) ❍ Taylor Preston ❍ AFFCO ❍ Ovation ❍ Crusader meats ❍ Harris Meats ❍ Fresh Meats ❍ Te Kuiti Meat Processors	❍ Auckland Meat Processors ❍ Prime Range Meats ❍ Progressive Meats ❍ Blue Sky Meats ❍ Lean Meats ❍ Wallace Meat ❍ Ashburton Meat Processors ❍ Other Local Trade Processor ❍ Other _____ If you supply lambs to another processer which one?_____ What % of stock do you supply to your primary processor?_____%

13. Please describe the length of your farming experience?	Years
Total years farming?	
Total years sheep farming?	
Total years farming on your **current** farm?	

14. What is your age in years? _____

Farm Information (Please answer as accurately as possible)

1. Farm Size	Effective Area (Hectares)
Total farm size (including leased area)	
Sheep area only (including leased area)	

2. During the last year what was the total area of forage, fodder or green crops grown on the sheep unit?	Area (ha)
Total Area Forage Crops	

3. Where is you farm located?

- ❍ North Island
- ❍ South Island

4. Which North or South Island farm class best describes your sheep unit?

North Island	South Island
❍ Hard Hill Country	❍ High Country
❍ Hill Country	❍ Finishing Breeding
❍ Easy Hill Semi-Intensive	❍ Intensive Finishing
❍ Intensive Finishing	❍ Mixed Cropping/Livestock Finishing

5. In what regional council area is your farm located?

❍ Northland	
❍ Auckland	
❍ Bay of Plenty	❍ Nelson - Marlborough
❍ Waikato	❍ Canterbury
❍ East Coast	❍ West Coast
❍ Hawke's Bay	❍ Otago
❍ Taranaki	❍ Southland
❍ Manawatu-Wanganui	
❍ Wellington	

6. How many full time labour units are working on your farm (including yourself)? _____

7. Do you have irrigation on your farm?

- ❍ Yes
- ❍ No (go to question 9)

8. If you have irrigation approximately what % area of your sheep operation is irrigated? _____ %

9. How would you describe the summer climate of your sheep unit?	10. How would you describe the winter temperature of your sheep unit?
❍ Extremely summer dry	❍ Extremely cold
❍ Moderately summer dry	❍ Moderately cold
❍ Sometimes summer dry	❍ Cold
❍ Rarely summer dry	❍ Mild
❍ Never summer dry	❍ Very mild
❍ Summer moist	❍ Warm

11. How would you describe the spring temperature of your sheep unit?	12. How would you describe the fertility of the soils on your sheep unit?
❍ Extremely cold ❍ Moderately cold ❍ Cold ❍ Mild ❍ Very mild ❍ Warm	❍ Extremely low fertility ❍ Low fertility ❍ Moderate fertility ❍ High fertility ❍ Extremely high fertility

13. What category best describes your sheep operation?

❑ Breeder only
❑ Breeder/finisher
❑ Finisher only

14. How many distinct, geographically separate blocks (more than ½ km apart) comprise your farm operation? _____

15. What were the total numbers of sheep wintered on your farm last year (at 30 June 2013)? _____ (head)

16. What was your average lambing % (If you have breeding stock) **_____%**

(this information will be kept strictly confidential)

17. Farm Debt and Income - Please estimate your	Percent (%)
Debt servicing as a percentage of total farm income	
Total farm debt as percentage of total farm assets	
Proportion of non-farm income as percentage of your total gross income (farm and non-farm)	

18. Which of the following stock types are part of you farming business (you may choose as many as applicable)

	Stock Units (30 June 2013)	% of Total Stock Units	% of Farm Income
Beef Breeding			
Beef Finishing			
Deer breeding			
Deer finishing			
Sheep breeding			
Sheep finishing			
Dairy grazing			
Other stock_____			

19. For your animals sold to slaughter, please indicate how often (over the last 5 years) you have: (if you have no beef or deer on your farm go to next question)		Not applicable	Never	Sometimes	Often	All of the Time
1	Sold your deer stock exclusively to one company?	❍	❍	❍	❍	❍
2	Sold your beef cattle exclusively to one company?	❍	❍	❍	❍	❍
3	Committed your deer stock to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍
4	Committed your beef cattle to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍
5	Committed your wool to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍

Please indicate the main breed of your sheep

20. Breeding ewes?

- ❍ Duel-purpose
- ❍ Corriedale
- ❍ Merino
- ❍ Other _____

21. Do you use a terminal sire?

- ❍ Yes
- ❍ No (go to question 23)

22. Over what % of your flock to you use the terminal sire? _____% Flock

23. Please indicate your sheep and beef sales last year (12 months till 30 June 2013)

Sales 12 months to 30 June 2013	Numbers (head)	% of Total sheep and beef Income
Sales lambs (slaughter)		
Sales lambs (store)		
Sales (other sheep) slaughter		
Sales (other sheep) store		
Sales Bull Beef - slaughter		
Sales Cows – slaughter		
Sales Steers – Prime slaughter		
Sales Heifers – Prime slaughter		
Sales Bull Beef- Store		
Sales Steers - Store		
Sales Heifers - Store		
Sales other _____		
Wool sales (Kg)	Kg	

24. In the last 12 months (approximately only)

With how many other farmers did you discuss operational practices, systems change, or practices to improve long-term profitability?

□ none □ 1-5 □ 6-10 □ 11-20 □ 21-50 □ 51-100 □ more than 100

With how many other farmers did you discuss operational practices, systems change, or practices to improve productivity?

□ none □ 1-5 □ 6-10 □ 11-20 □ 21-50 □ 51-100 □ more than 100

How many other farm operations have you visited in the last 12 months?

□ none □ 1-5 □ 6-10 □ 11-20 □ 21-50 □ 51-100 □ more than 100

25. Is your livestock buyer an employee of your lamb processor or are they an independent livestock buyer?

☐ employee of processor ☐ independent

(Independent means they work for themselves or a company other than the meat processor)

Details and Background

1. At what stage of the farm business cycle would you describe yourself?

- ❍ Entry
- ❍ Consolidation
- ❍ Growth/Expansion
- ❍ Exit

2. What was the highest level of education you attained?

- ❍ Primary school
- ❍ Secondary school (School Certificate/NCEA L1)
- ❍ Secondary School (University Entrance/NCEA L2)
- ❍ Post school certificate
- ❍ Polytech or private training establishment diploma or other non-university diploma
- ❍ University Diploma
- ❍ University Bachelor degree
- ❍ Post graduate university degree

3. If you have completed agricultural training or education which organisation did you attend?

- ❍ Lincoln University
- ❍ Massey University
- ❍ AgITO
- ❍ Telford
- ❍ Taratahi
- ❍ Other _____

4. As a small acknowledgment for your time we will either: Draw a random prize of $100 grocery voucher or donate $100 to Lifeline charity (www.lifeline.co.nz) Please select your preference:

- ❍ $100 grocery prize draw (attach your name and address if you want to enter the draw)
- ❍ $100 donation to charity

Survey Feedback

Approximately how long did it take you to complete the survey?

- ❍ 15 min
- ❍ 20 min
- ❍ 30 min
- ❍ 40 min
- ❍ 50 min
- ❍ more than 50 min

How much do you agree or disagree with the following statements?	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
The survey questions were clear and easy to understand	❍	❍	❍	❍	❍	❍
The survey length was reasonable	❍	❍	❍	❍	❍	❍
The survey questions were highly relevant	❍	❍	❍	❍	❍	❍
I would be happy to participate in similar surveys in the future	❍	❍	❍	❍	❍	❍

If you would like to participate in surveys in the future please enter your email address here:

_____

Please add any other comments or feedback on the survey.

Thank you for completing the survey.

Table G: 1 Questionnaire – Beef industry

Section A: Relationship with Beef Processor

(By beef processor we mean the processor or cooperative/company that you sell your beef to. This may be a processor and/or exporter and marketer of your beef)

You only need to fill in the survey if you sell a significant number of cattle to a beef processor.

	Please indicate how much do you agree or disagree with the following statements. **Regarding your current beef processor:**	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	We expect our relationship with our current beef processor to continue for a long time	○	○	○	○	○	○
2	We are willing to dedicate time, effort and resources to support our current beef processor in growing their markets and sales	○	○	○	○	○	○
3	We are proud to tell other farmers that we are a supplier to our current beef processor	○	○	○	○	○	○
4	We are willing to make long term investments and changes to our farm to better meet the requirements of our current beef processor and their customers	○	○	○	○	○	○
5	We help out our current beef processor in whatever ways they ask	○	○	○	○	○	○
6	Even if our current beef processor gives us a rather unlikely explanation we are confident that they are telling the truth	○	○	○	○	○	○
7	When making important decisions, our current beef processor is always concerned about our welfare	○	○	○	○	○	○
8	We can rely on our current beef processor to help us in ways not required by our agreement with them	○	○	○	○	○	○
9	We believe that our current beef processor will always treat us fairly	○	○	○	○	○	○
10	We can rely on our current beef processor without any fear they will take advantage of us even if the opportunity arises	○	○	○	○	○	○
11	We can rely on our current beef processor to always deliver the best returns from the market	○	○	○	○	○	○
12	The business outcomes achieved by supplying our current beef processor are more attractive than those of other competing companies we have supplied or could supply	○	○	○	○	○	○
Our relationship with our current beef processor could be characterised as:							
13	Having compatible goals and objectives	○	○	○	○	○	○
14	Having similar values	○	○	○	○	○	○
15	Involving a close personal interaction between both parties	○	○	○	○	○	○
16	Having strong mutual trust between both parties	○	○	○	○	○	○
17	Involving personal friendship between both parties	○	○	○	○	○	○
18	Involving give and take (reciprocity) between both parties	○	○	○	○	○	○
19	Involving strong personal bonds	○	○	○	○	○	○
Regarding your current beef processor							
20	Communications from our beef processor are open and honest	○	○	○	○	○	○
21	I feel informed about the organisation and the activities of our current beef processor	○	○	○	○	○	○
22	The costs and risks involved in supplying our current beef processor are greater than the benefits	○	○	○	○	○	○
Our current beef processor and ourselves try to promote:							
23	Frequent and intensive interaction between both parties	○	○	○	○	○	○
24	Interaction between different **levels** of staff in both businesses (management, field staff etc.)	○	○	○	○	○	○
25	Interaction between different **functions** of staff in both businesses (technical, admin, marketing etc.)	○	○	○	○	○	○

	Compared to alternatives, we have experienced the following disadvantages from supplying our current beef processor:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	Reduced flexibility in our farming operation	❍	❍	❍	❍	❍	❍
2	Increased production costs	❍	❍	❍	❍	❍	❍
3	Extra management effort and stress	❍	❍	❍	❍	❍	❍
4	Reduced farm profitability	❍	❍	❍	❍	❍	❍
5	Increased production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
6	Increased market risk involved in selling our cattle (price uncertainty)	❍	❍	❍	❍	❍	❍
Regarding your current beef processor							
7	As a business we feel very dependent on our current beef processor	❍	❍	❍	❍	❍	❍
8	We have made significant investments in our farm business in order to specifically meet the requirements of our current beef processor and their customers.	❍	❍	❍	❍	❍	❍
9	Our current beef processor is more dependent on us than we are on them	❍	❍	❍	❍	❍	❍
10	There has been a significant amount of specific knowledge we have had to learn in order to specifically meet the requirements of supplying our current beef processor.	❍	❍	❍	❍	❍	❍
11	We have made significant modifications to our farming system specifically to meet the requirements of supplying our current beef processor.	❍	❍	❍	❍	❍	❍
12	We are very dependent on our current beef processor.	❍	❍	❍	❍	❍	❍
13	If we did not do what our current beef processor asked we would not have received very good treatment from them	❍	❍	❍	❍	❍	❍
14	We have felt that by going along with what our current beef processor asked, we would be favoured on other occasions	❍	❍	❍	❍	❍	❍
15	Our current beef processor has hinted that they would take certain action that would affect our profitability if we did not go along with their requests	❍	❍	❍	❍	❍	❍
16	Our current beef processor is very dependent on us.	❍	❍	❍	❍	❍	❍
Regarding your communication with your current beef processor:							
17	We always let our current beef processor know as soon as possible of any unexpected problems with things such as delivery, or product quality	❍	❍	❍	❍	❍	❍
18	Keeping our current beef processor informed on our production plans is very important to us	❍	❍	❍	❍	❍	❍
Compared to alternative options, supplying our current beef processor has enabled us to:							
19	Grow our farming business	❍	❍	❍	❍	❍	❍
20	Access premium markets for our farm products	❍	❍	❍	❍	❍	❍
21	Adopt new technologies into our farming system (genetics, crops etc.)	❍	❍	❍	❍	❍	❍
22	Adapt our production to meet the requirements of customers for our products	❍	❍	❍	❍	❍	❍
23	Reduce our costs of production	❍	❍	❍	❍	❍	❍
24	Increase our farm profitability	❍	❍	❍	❍	❍	❍
25	Reduce the production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
26	Reduce the market risk involved in selling our cattle (price uncertainty)	❍	❍	❍	❍	❍	❍
Regarding the relationship with your current beef processor							
27	If our current livestock buyer moved to another beef processor we would change also	❍	❍	❍	❍	❍	❍
28	The commitment we have to our livestock buyer is more important than the commitment to our current beef processor	❍	❍	❍	❍	❍	❍

	Regarding the international market for beef:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	The nature of competition in the international market for beef is intense	❍	❍	❍	❍	❍	❍
2	There are rapid changes in consumer needs and preferences for beef	❍	❍	❍	❍	❍	❍
3	The market price for New Zealand beef on the international market is highly volatile	❍	❍	❍	❍	❍	❍
	Regarding the performance of your cattle operation						
4	The profitability of our beef operation was not satisfactory last year	❍	❍	❍	❍	❍	❍
5	We were very satisfied with the overall financial performance of our beef operation last year	❍	❍	❍	❍	❍	❍
6	We were very satisfied with the overall production of our beef operation last year	❍	❍	❍	❍	❍	❍
7	We were very satisfied with the price we received for our stock last year	❍	❍	❍	❍	❍	❍

Section B: You and your farm business

	Regarding yourself and your farm business:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	As a farm business we try to conduct business on as long term basis as possible	❍	❍	❍	❍	❍	❍
2	As a farm business, we try to remain as independent as possible	❍	❍	❍	❍	❍	❍
3	We are committed to farming beef cattle for the long term	❍	❍	❍	❍	❍	❍
4	We always target premiums for producing to the preferred weights and grades	❍	❍	❍	❍	❍	❍
5	We would aim to produce the best quality stock even if we were not able to get a premium	❍	❍	❍	❍	❍	❍
6	We are always wary of becoming too locked in to one processor that buys our stock	❍	❍	❍	❍	❍	❍
7	We make long term plans for the future of our farm business	❍	❍	❍	❍	❍	❍
8	It is important to us to be committed to one processor to supply our stock	❍	❍	❍	❍	❍	❍
9	We have made significant changes to our farming operation to better meet customer requirements	❍	❍	❍	❍	❍	❍
10	It is important for us to know who the customer of our product is	❍	❍	❍	❍	❍	❍
11	I like to work as part of a team	❍	❍	❍	❍	❍	❍
12	It is important to us to have more than one option to sell our stock	❍	❍	❍	❍	❍	❍
13	If the price was good it doesn't matter who we supply our stock to	❍	❍	❍	❍	❍	❍
14	We will always get better prices over the season if we play the market	❍	❍	❍	❍	❍	❍
15	Reducing the costs on our farm is the most important thing to us	❍	❍	❍	❍	❍	❍
16	It doesn't matter to me who the final consumer of my product is as long as I get the best price	❍	❍	❍	❍	❍	❍
17	We seem to have the ability to know how to buy and sell stock to get the best price from the market	❍	❍	❍	❍	❍	❍
18	There is little room to make improvements in our farm operation due to natural production constraints	❍	❍	❍	❍	❍	❍
19	I can't worry too much about marketing because my main concern is with production on my farm	❍	❍	❍	❍	❍	❍
20	Our farm business operates in a market where above average quality is important	❍	❍	❍	❍	❍	❍
21	The main things that affect our farm profitability are outside of my control (e.g. weather, price)	❍	❍	❍	❍	❍	❍
22	We are always looking for ways to differentiate our farm products and to gain a premium price	❍	❍	❍	❍	❍	❍

	Regarding yourself and your farm business:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
23	We are willing to modify our farming practices to meet customer needs even if it increases our costs	❍	❍	❍	❍	❍	❍
24	The main benefit from owning shares in a beef processor is to ensure you are treated fairly	❍	❍	❍	❍	❍	❍
25	The years when the farm has shown poor production or profit have been due to circumstance totally out of my control	❍	❍	❍	❍	❍	❍
26	Constantly expanding the size of the farm business is absolutely necessary to remain profitable	❍	❍	❍	❍	❍	❍
27	I like to find solutions to problems so that everyone comes out ahead	❍	❍	❍	❍	❍	❍
28	It is usually foolish to try and help other people to be successful	❍	❍	❍	❍	❍	❍
29	I value cooperation over competition	❍	❍	❍	❍	❍	❍
30	I always like to work for the good of the whole group rather than for my own individual benefit	❍	❍	❍	❍	❍	❍
31	We continually try to understand the needs of our customers even ones of which they are not yet aware	❍	❍	❍	❍	❍	❍
32	We try to incorporate solutions to future customer needs into our farming operation	❍	❍	❍	❍	❍	❍
33	We try to understand customers and to recognise their needs months or even years before the majority of the market may recognise them	❍	❍	❍	❍	❍	❍
34	We always deliver the quality of animals our current beef processor requires	❍	❍	❍	❍	❍	❍
35	We always deliver the number of animals we agree to supply to our current beef processor	❍	❍	❍	❍	❍	❍
36	We always try to collaborate and work with other suppliers to improve the overall performance of all suppliers	❍	❍	❍	❍	❍	❍
37	I would take steps to improve the environmental sustainability of our farm even if it was not important to customers	❍	❍	❍	❍	❍	❍
38	We continually try to improve our farm performance by improving output (animal production)	❍	❍	❍	❍	❍	❍
39	We have consistently managed to improve our farm efficiency	❍	❍	❍	❍	❍	❍
40	Being able to compare our farm production data with other beef producers is essential for us to improve performance	❍	❍	❍	❍	❍	❍
41	We continually try to improve our farm performance by lowering our costs of production	❍	❍	❍	❍	❍	❍
42	I avoid trying out new ideas in case they don't work	❍	❍	❍	❍	❍	❍
43	We continually strive to improve the quality of our stock	❍	❍	❍	❍	❍	❍
44	We are always looking for innovative ways to market our products	❍	❍	❍	❍	❍	❍
45	I would take steps to improve animal welfare even if it wasn't important to our customers	❍	❍	❍	❍	❍	❍
46	I seldom seek innovative ideas	❍	❍	❍	❍	❍	❍
47	We continually strive to improve our farm performance	❍	❍	❍	❍	❍	❍
48	Innovation is readily accepted in all aspects of our management	❍	❍	❍	❍	❍	❍
49	We continually try to improve our farm performance by achieving higher market returns for our products	❍	❍	❍	❍	❍	❍
50	Technical innovation based on research results are readily accepted in our farm operation	❍	❍	❍	❍	❍	❍
51	Innovation in our farm business is perceived as too risky and is resisted	❍	❍	❍	❍	❍	❍
52	I am generally a person who is fully prepared to take risks	❍	❍	❍	❍	❍	❍
53	I am always one of the first in the district to try something new	❍	❍	❍	❍	❍	❍

Please rate the relationship with your current beef processor on the following aspects:		Poor	Somewhat Poor	Average	Somewhat Good	Good	Very Good
1	Our trust in our current beef processor is ...	○	○	○	○	○	○
2	Our commitment towards our current beef processor is ...	○	○	○	○	○	○
3	Our satisfaction with our current beef processor is ...	○	○	○	○	○	○
4	Our collaboration with our current beef processor in the past has been ...	○	○	○	○	○	○
How does your current beef processor compare on the following aspects with competing/alternative companies that you could supply?		**Much Worse**	**Worse**	**Somewhat Worse**	**Somewhat Better**	**Better**	**Much Better**
1	Their marketing and sales skills.	○	○	○	○	○	○
2	Their skills for improving quality and efficiency in the supply chain.	○	○	○	○	○	○
3	Their ability to get a premium price from the market	○	○	○	○	○	○
4	Net return to supplying stock	○	○	○	○	○	○
5	Support services provided	○	○	○	○	○	○
6	Having reasonable policies	○	○	○	○	○	○
Please indicate your level of satisfaction with your current beef processor in relation to:		**Very Dissatisfied**	**Dissatisfied**	**Somewhat Dissatisfied**	**Somewhat Satisfied**	**Satisfied**	**Very Satisfied**
1	The price received for the animals you supply	○	○	○	○	○	○
2	The seasonal structure of the pricing schedule	○	○	○	○	○	○
3	The support provided by the stock buyer/supply manager	○	○	○	○	○	○
4	The quantity (amount, frequency) of communication	○	○	○	○	○	○
5	The timeliness of communication	○	○	○	○	○	○

How important to you are the following:		Not at all Important	Unimportant	Somewhat Important	Very Important	Extremely Important
1	Achieving a premium price for my stock	○	○	○	○	○
2	Benchmarking farm performance with other suppliers	○	○	○	○	○
3	Social interaction with other suppliers	○	○	○	○	○
4	Having processing space available at the right time (as determined by feed supply)	○	○	○	○	○
5	Knowing the price I will receive for stock well ahead of time (price certainty)	○	○	○	○	○
6	Being a highly profitable farmer to your sense of self-identity (i.e., your sense of who you are)?	○	○	○	○	○
7	Being a farmer who takes good care of the environment to your sense of self-identity	○	○	○	○	○

Compared to other beef farmers how would you evaluate:		Much Lower	Slightly Lower	About the Same	Higher	Much Higher
1	The profitability of your beef operation over the last 3 years?	❍	❍	❍	❍	❍
2	The price received for your beef cattle over the last 3 years?	❍	❍	❍	❍	❍
In your beef production system, how much certainty is there regarding:		**Fairly certain**	**Somewhat certain**	**Uncertain**	**Very uncertain**	**Extremely uncertain**
1	The numbers and weight of the animals you can supply to your beef processor if planning for delivery in 8 months' ahead?	❍	❍	❍	❍	❍
2	Your production costs over 3 years?	❍	❍	❍	❍	❍

Section C

1. How often would you have contact with someone from your current beef processor?

	By Phone, Email or Text	Face to Face
Less than once every 3 months	❍	❍
Once every 3 months	❍	❍
Less than Once a Month	❍	❍
Once a Month	❍	❍
2-3 Times a Month	❍	❍
Once a Week	❍	❍
2-3 Times a Week	❍	❍

2. Please indicate how you would react if one of your current beef processor competitors consistently offered a higher price for animals of equal quality/specifications?

- ❍ Switch to competitor as soon as technically feasible;
- ❍ Switch at end of contract;
- ❍ Reduce the amount you supply to your current beef processor
- ❍ Continue to supply your current beef processor and support them to match the competitor's performance
- ❍ A competitors price would have no influence on our commitment to our current beef processor

3. How many other beef processors are there in your area that you could potentially supply your cattle to? _____

4. Approximately what % of your total farm income comes from sales to your current beef processor? _____
(including other stock e.g. lambs)

5. How would you rate the actual returns you achieve from supplying your current beef processor, compared to what you would expect to achieve for your animals?

- ❍ Far short of expectations
- ❍ Short of expectations
- ❍ Equals expectations
- ❍ Exceeds expectations
- ❍ Far exceeds expectations

8. Owning shares in our beef processor means we can influence the decisions they make that affect our farm business (answer if a shareholder)

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

9. In the last year have you supplied beef cattle on contract (with quality and/or delivery specifications) to your current beef processor?

- ❍ Yes
- ❍ No (go to question 12)

10. What % of your total beef cattle sales were supplied on contract? _____%

11. For how many years have you supplied cattle on contract to your current beef processor?

- ❍ Do not supply on contract
- ❍ 0 - 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years +

Which beef company do you supply your cattle to? (Select the one you supply most of your beef cattle to)

❍ Silver Fern Farms	❍ Universal Beef Packers
❍ Alliance Group	❍ Auckland Meat Processors
❍ CMP/Riverland's (ANZCO)	❍ Prime Range Meats
❍ Taylor Preston	❍ First light Foods Ltd
❍ AFFCO	❍ Lean Meats
❍ Clover Export	❍ Wallace Meat
❍ Crusader meats	❍ Ashburton Meat Processors
❍ Harris Meats	❍ Other Local Trade Processor
❍ Greenlea	❍ Other _____

13. Please describe the length of your farming experience?	Years
Total years farming?	
Total years cattle farming?	
Total years farming on your **current** farm?	

14. What is your age in years? _____

Farm Information (Please answer as accurately as possible)

1. Farm Size	Effective Area (Hectares)
Total farm size (including leased area)	
Beef finishing area only (including leased area)	

2. During the last year what was the total area of forage, fodder or green crops grown on the beef cattle	Area (ha)
Total Area Forage Crops	

3. Where is you farm located?

- ❍ North Island
- ❍ South Island

4. Which North or South Island farm class best describes your cattle unit?

North Island	South Island
❍ Hard Hill Country	❍ High Country
❍ Hill Country	❍ Finishing Breeding
❍ Easy Hill Semi-Intensive	❍ Intensive Finishing
❍ Intensive Finishing	❍ Mixed Cropping/Livestock Finishing

5. In what regional council area is your farm located?

❍ Northland	❍ Nelson - Marlborough
❍ Auckland	❍ Canterbury
❍ Bay of Plenty	❍ West Coast
❍ Waikato	❍ Otago
❍ East Coast	❍ Southland
❍ Hawke's Bay	
❍ Taranaki	
❍ Manawatu-Wanganui	
❍ Wellington	

6. How many full time labour units are working on your farm (including yourself)? _____

7. Do you have irrigation on your farm?

❍ Yes
❍ No (go to question 9)

8. If you have irrigation approximately what % area of your cattle operation is irrigated? _____ **%**

9. How would you describe the summer climate of your beef cattle unit?	10. How would you describe the winter temperature of your beef cattle unit?
❍ Extremely summer dry	❍ Extremely cold
❍ Moderately summer dry	❍ Moderately cold
❍ Sometimes summer dry	❍ Cold
❍ Rarely summer dry	❍ Mild
❍ Never summer dry	❍ Very mild
❍ Summer moist	❍ Warm

11. How would you describe the spring temperature of your beef cattle unit?	12. How would you describe the fertility of the soils on your beef cattle unit?
❍ Extremely cold	❍ Extremely low fertility
❍ Moderately cold	❍ Low fertility
❍ Cold	❍ Moderate fertility
❍ Mild	❍ High fertility
❍ Very mild	❍ Extremely high fertility
❍ Warm	

13. What category best describes your beef operation?

❑ Breeder only
❑ Breeder/finisher
❑ Finisher only

14. How many distinct, geographically separate blocks (more than ½ km apart) comprise your farm operation? _____

15. What were the numbers of beef cattle wintered on your farm last year (at 30 June 2013)?	
Total cattle numbers (head)	
16. What was your average calving % (If you have breeding stock)	
Farm average calving(%)	

17. Farm Debt and Income - Please estimate your: (this information will be kept strictly confidential)

	Percent (%)
Debt servicing as a percentage of total farm income	
Total farm debt as percentage of total farm assets	
Proportion of non-farm income as percentage of your total gross income (farm and non-farm)	

18. Which of the following stock types are part of you farming business (you may choose as many as applicable)

	Stock Units (30 June 2013)	% of Total Stock Units	% of Farm Income
Beef Breeding			
Beef Finishing			
Deer breeding			
Deer finishing			
Sheep breeding			
Sheep finishing			
Dairy grazing			
Other stock			

	19. For your animals sold to slaughter, please indicate how often (over the last 5 years) you have: (if you have no sheep or deer go to next question)	Not applicable	Never	Sometimes	Often	All of the Time
1	Sold your deer stock exclusively to one company?	❍	❍	❍	❍	❍
2	Sold your finished lambs exclusively to one company?	❍	❍	❍	❍	❍
3	Committed your deer stock to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍
4	Committed your lambs to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍

Please indicate the main breed of your cattle

20. Beef finishing cattle?	**21. Beef breeding cows?**
❍ Dairy cross ❍ Pure beef breed ❍ Beef breed cross	❍ Dairy cross ❍ Pure beef breed ❍ Beef breed cross
22. Maternal sire bulls?	**23. Terminal sire bulls?**
❍ Dairy cross ❍ Pure beef breed ❍ Beef breed cross	❍ Dairy cross ❍ Pure beef breed ❍ Beef breed cross

24. Please indicate your beef cattle sales last year (2013)

Sales 12 months to 30 June 2013	Numbers (head)	% of Total Cattle Income
Sales Steers - Prime		
Sales Steers - Prime		
Sales Bull Beef - (slaughter)		
Sales Cows – (slaughter)		
Sales Bull Beef - Store		
Bull Sales - Sires		
Sales Steers - Store		
Sales Other _____		

25. In the last 12 months (approximately only)

With how many other farmers did you discuss operational practices, systems change, or practices to improve long-term profitability?						
□ none	□ 1-5	□ 6-10	□ 11-20	□ 21-50	□ 51-100	□ more than 100
With how many other farmers did you discuss operational practices, systems change, or practices to improve productivity?						
□ none	□ 1-5	□ 6-10	□ 11-20	□ 21-50	□ 51-100	□ more than 100
How many other farm operations have you visited in the last 12 months?						
□ none	□ 1-5	□ 6-10	□ 11-20	□ 21-50	□ 51-100	□ more than 100

Final Details and Background

1. At what stage of the farm business cycle would you describe yourself?

- ❍ Entry
- ❍ Consolidation
- ❍ Growth/Expansion
- ❍ Exit

2. What was the highest level of education you attained?

- ❍ Primary school
- ❍ Secondary school (School Certificate/NCEA L1)
- ❍ Secondary School (University Entrance/NCEA L2)
- ❍ Post school certificate
- ❍ Polytech or private training establishment diploma or other non-university diploma
- ❍ University Diploma
- ❍ University Bachelor degree
- ❍ Post graduate university degree

3. If you have completed agricultural training or education which organisation did you attend?

- ❍ Lincoln University
- ❍ Massey University
- ❍ AgITO
- ❍ Telford
- ❍ Taratahi
- ❍ Other _____

4. As a small acknowledgment for your time we will either: Draw a random prize of $100 grocery voucher or donate $100 to Lifeline charity (www.lifeline.co.nz) Please select your preference:

- ❍ $100 grocery prize draw (attach your name and address if you want to enter the draw)
- ❍ $100 donation to charity

Survey Feedback

Finally please take a few moments to give some feedback on the survey.

Approximately how long did it take you to complete the survey?

- ❍ 15 min
- ❍ 20 min
- ❍ 30 min
- ❍ 40 min
- ❍ 50 min
- ❍ more than 50 min

How much do you agree or disagree with the following statements?		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	The survey questions were clear and easy to understand	❍	❍	❍	❍	❍	❍
2	The survey length was reasonable	❍	❍	❍	❍	❍	❍
3	The survey questions were highly relevant	❍	❍	❍	❍	❍	❍
4	I would be happy to participate in similar surveys in the future	❍	❍	❍	❍	❍	❍

If you would like to participate in surveys in the future please enter your email address here:

_____

Please add any other comments or feedback on the survey.

Thank you for completing the survey.

Table G: 2 Survey Questionnaire – Deer industry

Section A: Relationship with Venison Processor

(By venison processor we mean the processor or cooperative/company that you sell your venison to. This may be a processor and/or exporter and marketer of your venison)

Please indicate how much do you agree or disagree with the following statements.

	Regarding your current venison processor:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	We expect our relationship with our current venison processor to continue for a long time	❍	❍	❍	❍	❍	❍
2	We are willing to dedicate time, effort and resources to support our current venison processor in growing their markets and sales	❍	❍	❍	❍	❍	❍
3	We are proud to tell other farmers that we are a supplier to our current venison processor	❍	❍	❍	❍	❍	❍
4	We are willing to make long term investments and changes to our farm to better meet the requirements of our current venison processor and their customers	❍	❍	❍	❍	❍	❍
5	We help out our current venison processor in whatever ways they ask	❍	❍	❍	❍	❍	❍
6	Even if our current venison processor gives us a rather unlikely explanation we are confident that they are telling the truth	❍	❍	❍	❍	❍	❍
7	When making important decisions, our current venison processor is always concerned about our welfare	❍	❍	❍	❍	❍	❍
8	We can rely on our current venison processor to help us in ways not required by our agreement with them	❍	❍	❍	❍	❍	❍
9	We believe that our current venison processor will always treat us fairly	❍	❍	❍	❍	❍	❍
10	We can rely on our current venison processor without any fear they will take advantage of us even if the opportunity arises	❍	❍	❍	❍	❍	❍
11	We can rely on our current venison processor to always deliver the best returns from the market	❍	❍	❍	❍	❍	❍
12	The business outcomes achieved by supplying our current venison processor are more attractive than those of other competing companies we have supplied or could supply	❍	❍	❍	❍	❍	❍
Our relationship with our current venison processor could be characterised as:							
13	Having compatible goals and objectives	❍	❍	❍	❍	❍	❍
14	Having similar values	❍	❍	❍	❍	❍	❍
15	Involving a close personal interaction between both parties	❍	❍	❍	❍	❍	❍
16	Having strong mutual trust between both parties	❍	❍	❍	❍	❍	❍
17	Involving personal friendship between both parties	❍	❍	❍	❍	❍	❍
18	Involving give and take (reciprocity) between both parties	❍	❍	❍	❍	❍	❍
19	Involving strong personal bonds	❍	❍	❍	❍	❍	❍
Regarding your current venison processor							
20	Communications from our venison processor are open and honest	❍	❍	❍	❍	❍	❍
21	I feel informed about the organisation and the activities of our current venison processor	❍	❍	❍	❍	❍	❍
22	The costs and risks involved in supplying our current venison processor are greater than the benefits	❍	❍	❍	❍	❍	❍
Our current venison processor and ourselves try to promote:							
23	Frequent and intensive interaction between both parties	❍	❍	❍	❍	❍	❍
24	Interaction between different **levels** of staff in both businesses (management, supervisors.)	❍	❍	❍	❍	❍	❍
25	Interaction between different **functions** of staff in both businesses (technical, admin, marketing etc.)	❍	❍	❍	❍	❍	❍

	Compared to alternatives, we have experienced the following disadvantages from supplying our current venison processor:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	Reduced flexibility in our farming operation	❍	❍	❍	❍	❍	❍
2	Increased production costs	❍	❍	❍	❍	❍	❍
3	Extra management effort and stress	❍	❍	❍	❍	❍	❍
4	Reduced farm profitability	❍	❍	❍	❍	❍	❍
5	Increased production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
6	Increased market risk involved in selling our deer (price uncertainty)	❍	❍	❍	❍	❍	❍
Regarding your current venison processor							
7	As a business we feel very dependent on our current venison processor	❍	❍	❍	❍	❍	❍
8	We have made significant investments in our farm business in order to specifically meet the requirements of our current venison processor and their customers.	❍	❍	❍	❍	❍	❍
9	Our current venison processor is more dependent on us than we are on them	❍	❍	❍	❍	❍	❍
10	There has been a significant amount of specific knowledge we have had to learn in order to specifically meet the requirements of supplying our current venison processor.	❍	❍	❍	❍	❍	❍
11	We have made significant modifications to our farming system specifically to meet the requirements of supplying our current venison processor.	❍	❍	❍	❍	❍	❍
12	We are very dependent on our current venison processor.	❍	❍	❍	❍	❍	❍
13	If we did not do what our current venison processor asked we would not have received very good treatment from them	❍	❍	❍	❍	❍	❍
14	We have felt that by going along with what our current venison processor asked, we would be favoured on other occasions	❍	❍	❍	❍	❍	❍
15	Our current venison processor has hinted that they would take certain action that would affect our profitability if we did not go along with their requests	❍	❍	❍	❍	❍	❍
16	Our current venison processor is very dependent on us.	❍	❍	❍	❍	❍	❍
Regarding your communication with your current venison processor:							
17	We always let our current venison processor know as soon as possible of any unexpected problems with things such as delivery, or product quality	❍	❍	❍	❍	❍	❍
18	Keeping our current venison processor informed on our production plans is very important to us	❍	❍	❍	❍	❍	❍
Compared to alternative options, supplying our current venison processor has enabled us to:							
19	Grow our farming business	❍	❍	❍	❍	❍	❍
20	Access premium markets for our farm products	❍	❍	❍	❍	❍	❍
21	Adopt new technologies into our farming system (genetics, crops etc.)	❍	❍	❍	❍	❍	❍
22	Adapt our production to meet the requirements of customers for our products	❍	❍	❍	❍	❍	❍
23	Reduce our costs of production	❍	❍	❍	❍	❍	❍
24	Increase our farm profitability	❍	❍	❍	❍	❍	❍
25	Reduce the production risk on our farm (production uncertainty)	❍	❍	❍	❍	❍	❍
26	Reduce the market risk involved in selling our deer (price uncertainty)	❍	❍	❍	❍	❍	❍

	Regarding the international market for venison:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	The nature of competition in the international market for venison is intense	❍	❍	❍	❍	❍	❍
2	There are rapid changes in consumer needs and preferences for venison	❍	❍	❍	❍	❍	❍
3	The market price for New Zealand venison on the international market is highly volatile	❍	❍	❍	❍	❍	❍
	Regarding the performance of your deer operation						
4	The profitability of our deer operation was not satisfactory last year	❍	❍	❍	❍	❍	❍
5	We were very satisfied with the overall financial performance of our deer operation last year	❍	❍	❍	❍	❍	❍
6	We were very satisfied with the overall production of our deer operation last year	❍	❍	❍	❍	❍	❍
7	We were very satisfied with the price we received for our stock last year	❍	❍	❍	❍	❍	❍

Section B: You and your farm business

	Regarding yourself and your farm business:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	As a farm business we try to conduct business on as long term basis as possible	❍	❍	❍	❍	❍	❍
2	As a farm business, we try to remain as independent as possible	❍	❍	❍	❍	❍	❍
3	We are committed to deer farming for the long term	❍	❍	❍	❍	❍	❍
4	We always target premiums for producing to the preferred weights and grades	❍	❍	❍	❍	❍	❍
5	We would aim to produce the best quality stock even if we were not able to get a premium	❍	❍	❍	❍	❍	❍
6	We are always wary of becoming too locked in to one processor that buys our stock	❍	❍	❍	❍	❍	❍
7	We make long term plans for the future of our farm business	❍	❍	❍	❍	❍	❍
8	It is important to us to be committed to one processor to supply our stock	❍	❍	❍	❍	❍	❍
9	We have made significant changes to our farming operation to better meet customer requirements	❍	❍	❍	❍	❍	❍
10	It is important for us to know who the customer of our product is	❍	❍	❍	❍	❍	❍
11	I like to work as part of a team	❍	❍	❍	❍	❍	❍
12	It is important us to have more than one option to sell our stock	❍	❍	❍	❍	❍	❍
13	If the price was good it doesn't matter who we supply our stock to	❍	❍	❍	❍	❍	❍
14	You will always get better prices over the season if you play the market	❍	❍	❍	❍	❍	❍
15	Reducing the costs on our farm is the most important thing to us	❍	❍	❍	❍	❍	❍
16	It doesn't matter to me who the final consumer of my product is as long as I get the best price	❍	❍	❍	❍	❍	❍
17	We seem to have the ability to know how to buy and sell stock to get the best price from the market	❍	❍	❍	❍	❍	❍
18	There is little room to make improvements in our farm operation due to natural production constraints	❍	❍	❍	❍	❍	❍
19	I can't worry too much about marketing because my main concern is with production on my farm	❍	❍	❍	❍	❍	❍
20	Our farm business operates in a market where above average quality is important	❍	❍	❍	❍	❍	❍
21	The main things that affect our farm profitability are outside of my control (e.g. weather, price)	❍	❍	❍	❍	❍	❍
22	We are always looking for ways to differentiate our farm products and to gain a premium price	❍	❍	❍	❍	❍	❍

	Regarding yourself and your farm business:	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
23	We are willing to modify our farming practices to meet customer needs even if it increases our costs	❍	❍	❍	❍	❍	❍
24	The main benefit from owning shares in a venison processor is ensure you are treated fairly	❍	❍	❍	❍	❍	❍
25	The years when the farm has shown poor production or profit have been due to circumstance totally out of my control	❍	❍	❍	❍	❍	❍
26	Constantly expanding the size of the farm business is absolutely necessary to remain profitable	❍	❍	❍	❍	❍	❍
27	I like to find solutions to problems so that everyone comes out ahead	❍	❍	❍	❍	❍	❍
28	It is usually foolish to try and help other people to be successful	❍	❍	❍	❍	❍	❍
29	I value cooperation over competition	❍	❍	❍	❍	❍	❍
30	I always like to work for the good of the whole group rather than for my own individual benefit	❍	❍	❍	❍	❍	❍
31	We continually try to understand the needs of our customers even ones of which they are not yet aware	❍	❍	❍	❍	❍	❍
32	We try to incorporate solutions to future customer needs into our farming operation	❍	❍	❍	❍	❍	❍
33	We try to understand customers and to recognise their needs months or even years before the majority of the market may recognise them	❍	❍	❍	❍	❍	❍
34	We always deliver the quality of animals our current venison processor requires	❍	❍	❍	❍	❍	❍
35	We always deliver the number animals we agree to supply to our current venison processor	❍	❍	❍	❍	❍	❍
36	We always try to collaborate and work with other suppliers to improve the overall performance of all suppliers	❍	❍	❍	❍	❍	❍
37	I would take steps to improve the environmental sustainability of our farm even if it was not important to customers	❍	❍	❍	❍	❍	❍
38	We continually try to improve our farm performance by improving output (animal production)	❍	❍	❍	❍	❍	❍
39	We have consistently managed to improve our farm efficiency	❍	❍	❍	❍	❍	❍
40	Being able to compare our farm production data with other venison producers is essential for us to improve performance	❍	❍	❍	❍	❍	❍
41	We continually try to improve our farm performance by lowing our costs of production	❍	❍	❍	❍	❍	❍
42	I avoid trying out new ideas in case they don't work	❍	❍	❍	❍	❍	❍
43	We continually strive to improve the quality of our stock	❍	❍	❍	❍	❍	❍
44	We are always looking for innovative ways to market our products	❍	❍	❍	❍	❍	❍
45	I would take steps to improve animal welfare even if it wasn't important to our customers	❍	❍	❍	❍	❍	❍
46	I seldom seek innovative ideas	❍	❍	❍	❍	❍	❍
47	We continually strive to improve our farm performance	❍	❍	❍	❍	❍	❍
48	Innovation is readily accepted in all aspects of our management	❍	❍	❍	❍	❍	❍
49	We continually try to improve our farm performance by achieving higher market returns for our products	❍	❍	❍	❍	❍	❍
50	Technical innovation based on research results are readily accepted in our farm operation	❍	❍	❍	❍	❍	❍
51	Innovation in our farm business is perceived as too risky and is resisted	❍	❍	❍	❍	❍	❍

Please rate the relationship with your current venison processor on the following aspects:		Poor	Somewhat Poor	Average	Somewhat Good	Good	Very Good
1	Our trust in our current venison processor is ...	○	○	○	○	○	○
2	Our commitment towards our current venison processor is ...	○	○	○	○	○	○
3	Our satisfaction with our current venison processor is ...	○	○	○	○	○	○
4	Our collaboration with our current venison processor in the past has been ...	○	○	○	○	○	○

How does your current venison processor compare on the following aspects with competing/alternative companies that you could supply?		Much Worse	Worse	Somewhat Worse	Somewhat Better	Better	Much Better
1	Their marketing and sales skills.	○	○	○	○	○	○
2	Their skills for improving quality and efficiency in the supply chain.	○	○	○	○	○	○
3	Their ability to get a premium price from the market	○	○	○	○	○	○
4	Net return to supplying stock	○	○	○	○	○	○
5	Support services provided	○	○	○	○	○	○
6	Having reasonable policies	○	○	○	○	○	○

Please indicate your level of satisfaction with your current venison processor in relation to:		Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Satisfied	Very Satisfied
1	The price received for the animals you supply	○	○	○	○	○	○
2	The seasonal structure of the pricing schedule	○	○	○	○	○	○
3	The support provided by the stock buyer/supply manager	○	○	○	○	○	○
4	The quantity (amount, frequency) of communication	○	○	○	○	○	○
5	The timeliness of communication	○	○	○	○	○	○

How important to you are the following:		Not at all Important	Somewhat Unimportant	Somewhat Important	Very Important	Extremely Important
1	Achieving a premium price for my stock	○	○	○	○	○
2	Benchmarking farm performance with other suppliers	○	○	○	○	○
3	Social interaction with other suppliers	○	○	○	○	○
4	Having processing space available at the right time	○	○	○	○	○
5	Knowing the price I will receive for stock well ahead of time (price certainty)	○	○	○	○	○

Compared to other deer farmers how would you evaluate:		Much Lower	Slightly Lower	About the Same	Higher	Much Higher
1	The profitability of your deer operation over the last 3 years?	❍	❍	❍	❍	❍
2	The price received for your deer over the last 3 years?	❍	❍	❍	❍	❍
In your farm production, how much certainty is there regarding:		**Fairly certain**	**Somewhat certain**	**Uncertain**	**Very uncertain**	**Extremely uncertain**
1	The numbers and weight of the animals you can supply to your venison processor if planning for delivery in 8 months' ahead?	❍	❍	❍	❍	❍
2	Your production costs over 3 years?	❍	❍	❍	❍	❍

Section C

1. How often would you have contact with someone from our current venison processor?

	By Phone, Email or Text	Face to Face
Less than once every 3 months	❍	❍
Once every 3 months	❍	❍
Less than Once a Month	❍	❍
Once a Month	❍	❍
2-3 Times a Month	❍	❍
Once a Week	❍	❍
2-3 Times a Week	❍	❍

2. Please indicate how would you react if one of your current venison processor competitors consistently offered a higher price for animals of equal quality/specifications?

- ❍ Switch to competitor as soon as technically feasible;
- ❍ Switch at end of contract;
- ❍ Reduce the amount you supply to your current venison processor
- ❍ Continue to supply your current venison processor and support them to match the competitor's performance
- ❍ A competitors price would have no influence on my commitment to our current venison processor

3. How many other venison processors are there in your area that you could potentially supply your deer to? _____

4. Approximately what % of your total farm income comes from sales to your current venison processor? _____

5. How would you rate the actual returns you achieve from supplying your current venison processor, compared to what you would expect to achieve for your animals?

- ❍ Far short of expectations
- ❍ Short of expectations
- ❍ Equals expectations
- ❍ Exceeds expectations
- ❍ Far exceeds expectations

	Please indicate how you would rate yourself on the following compared to other deer farmers in New Zealand	Below Average	Average	Above Average	Significantly above average	Top 25%	Top 10%	Top 5%
1	Your ability to deliver the numbers of quality stock when required	❍	❍	❍	❍	❍	❍	❍
2	Your ability to implement innovation and new technology on your farm	❍	❍	❍	❍	❍	❍	❍
3	Your ability to reduce production costs and increase farm efficiency	❍	❍	❍	❍	❍	❍	❍
4	Your overall farm management skills	❍	❍	❍	❍	❍	❍	❍

Section D: Background and Experience

The following questions will give you an opportunity to tell us about your background and experience.

1. Please indicate your gender.

- ❍ Male
- ❍ Female

2. What statement best describes you?

- ❍ Farm owner and manager
- ❍ Farm owner
- ❍ Farm manager
- ❍ Other (please state): _____

3. Which of the following best describes the ownership of your farm?

- ❍ Corporate farm
- ❍ Family farm
- ❍ Maori trust/corporation
- ❍ Other (please state) _____

4. Please indicate how much influence do you have in the decision making on the farm?		None	Little	Some	A Lot	Most	Nearly All	All
1	For day to day (operational) management decisions	❍	❍	❍	❍	❍	❍	❍
2	For long term strategic decisions	❍	❍	❍	❍	❍	❍	❍

5. How many years have you supplied your current venison processor?

- ❍ Less than 1 year
- ❍ 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years +

6. Is your farm business a shareholder in your current venison processor?

- ❍ Yes
- ❍ No (go to question 9)

7. How many years has your farm business been a shareholder of your current venison processor?

- ❍ 0 - 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years +

8. Owning shares in our venison processor means I can influence the decisions they make that affect my farm business
(answer if a shareholder)

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Neither Agree nor Disagree
- ❍ Agree
- ❍ Strongly Agree

9. In the last year have you supplied deer on contract (with quality and/or delivery specifications) to your current venison processor?

- ❍ Yes
- ❍ No (go to question 12)

10. What % of your total deer sales were supplied on contract? _____%

11. For how many years have you supplied deer on contract to your current venison processor?

- ❍ Do not supply on contract
- ❍ 0 - 1 year
- ❍ 2 years
- ❍ 3 years
- ❍ 4 years
- ❍ 5 years +

12. Which venison company do you supply your deer to?

- ❑ First light Foods Ltd
- ❑ Silver Fern Farms
- ❑ Alliance Group
- ❑ Duncan and Company
- ❑ Mountain River Venison
- ❑ Other _____

13. Please describe the length of your farming experience?

	Years
Total years farming?	
Total years deer farming?	
Total years on your current farm?	

14. What is your age in years? _____

Farm Information

The Following questions will give you an opportunity to tell us about your farm. Please answer as accurately as possible.

1. Farm Size

	Effective Area (Hectares)
Total farm size	
Deer operation only	

2. During the last year what was the total area of forage, fodder or green crops grown on the deer unit?

	Area (ha)
Total Area Forage Crops	

3. Where is you farm located?

- ❍ North Island
- ❍ South Island

4. Which North or South Island farm class best describes your deer unit?

North Island	South Island
❍ Hard Hill Country ❍ Hill Country ❍ Easy Hill Semi-Intensive ❍ Intensive Finishing	❍ High Country ❍ Finishing Breeding ❍ Intensive Finishing ❍ Mixed Cropping/Livestock Finishing

5. In what region is your farm located?

❍ Northland ❍ Auckland ❍ Bay of Plenty ❍ Waikato ❍ East Coast ❍ Hawke's Bay ❍ Taranaki ❍ Manawatu-Wanganui ❍ Wellington	❍ Nelson - Marlborough ❍ Canterbury ❍ West Coast ❍ Otago ❍ Southland

6. How many full time labour units are working on your farm (including yourself)? _____

7. Do you have irrigation on your farm?

- ❍ Yes
- ❍ No (go to question 9)

8. If you have irrigation approximately what % area of your deer operation is irrigated? _____ %

9. How would you describe the summer climate of your deer unit?	**10. How would you describe the winter temperature of your deer unit?**
❍ Extremely summer dry ❍ Moderately summer dry ❍ Sometimes summer dry ❍ Rarely summer dry ❍ Never summer dry ❍ Summer moist	❍ Extremely cold ❍ Moderately cold ❍ Cold ❍ Mild ❍ Very mild ❍ Warm

11. How would you describe the spring temperature of your deer unit?	**12. How would you describe the fertility of the soils on your deer unit?**
❍ Extremely cold ❍ Moderately cold ❍ Cold ❍ Mild ❍ Very mild ❍ Warm	❍ Extremely low fertility ❍ Low fertility ❍ Moderate fertility ❍ High fertility ❍ Extremely high fertility

13. What type of operation is your deer farm?

- ❑ Breeder only
- ❑ Breeder/finisher
- ❑ Finisher only

14. What were the total numbers of stock units and deer sales income last year?

	Percent of total (%)
What are the deer stock units as percentage (%) of your total Stock units at 30 June 2012?	
What is the deer sales income as percentage (%) of total farm income?	

15. What were the approximate numbers of deer wintered on your farm last year (30 June 2012)?

	Deer wintered (head)
Total deer numbers (head)	

16. What was your average fawning % (If you have breeding stock)

	Fawning %
Farm average (%)	

17. Farm Debt and Income - Please estimate your: (this information will be kept confidential)

	Percent (%)
Debt servicing as a percentage of total farm income	
Total farm debt as percentage of total farm assets	
Proportion of non-farm income as percentage of your total gross income (farm and non-farm)	

18. Which of the following stock types are also part of you farming business (you may choose as many as applicable)

	Stock Units	% of Total Stock Units
Beef breeding		
Beef finishing		
Sheep breeding		
Sheep finishing		
Dairy grazing		
Other stock _____		

19. For your animals sold to slaughter, please indicate how often (over the last 5 years) you have: (if you have no sheep or beef go to next question)		Not applicable	Never	Sometimes	Often	All of the Time
1	Sold your beef stock exclusively to one company?	❍	❍	❍	❍	❍
2	Sold your finished lambs exclusively to one company?	❍	❍	❍	❍	❍
3	Committed your beef stock to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍
4	Committed your lambs to a contract (with quality and/or delivery specifications)	❍	❍	❍	❍	❍

Final Details and Background

1. At what stage of the farm business cycle would you describe yourself?

- ❍ Entry
- ❍ Consolidation
- ❍ Growth/Expansion
- ❍ Exit

2. What was the highest level of education you attained?

- ❍ Primary school
- ❍ Secondary school (School Certificate/NCEA L1)
- ❍ Secondary School (University Entrance/NCEA L2)
- ❍ Post school certificate
- ❍ Polytech or private training establishment diploma or other non-university diploma
- ❍ University Diploma
- ❍ University Bachelor degree
- ❍ Post graduate university degree

3. If you have completed agricultural training or education which organisation did you attend?

- ❍ Lincoln University
- ❍ Massey University
- ❍ AgITO
- ❍ Telford
- ❍ Taratahi
- ❍ Other _____

4. As a small acknowledgment for your time we will either: Draw a random prize of $100 grocery voucher or donate $100 to Lifeline charity (www.lifeline.co.nz) Please select your preference:

- ❍ $100 grocery prize draw (attach your name and address if you want to enter the draw)
- ❍ $100 donation to charity

Survey Feedback

Finally please take a few moments to give some feedback on the survey.

Approximately how long did it take you to complete the survey?

- ❍ 15 min
- ❍ 20 min
- ❍ 30 min
- ❍ 40 min
- ❍ 50 min
- ❍ more than 50 min

	How much do you agree or disagree with the following statements?	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1	The survey questions were clear and easy to understand	❍	❍	❍	❍	❍	❍
2	The survey length was reasonable	❍	❍	❍	❍	❍	❍
3	The survey questions were highly relevant	❍	❍	❍	❍	❍	❍
4	I would be happy to participate in similar surveys in the future	❍	❍	❍	❍	❍	❍

If you would like to participate in surveys in the future please enter your email address here:

_____

Please add any other comments or feedback on the survey.

Appendix H - Published paper on qualitative research: Case study analysis on supplier commitment to added value agri-food supply chains in New Zealand

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Case study analysis on supplier commitment to added value agri-food supply chains in New Zealand

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Abstract

This research identifies what attracts suppliers to be committed to long-term relationships in New Zealand agri-food supply chains where suppliers are required to consistently deliver to high product specifications. It also looks at what factors determine supplier's ongoing commitment and how to build strong enduring supply chain relationships. Semi structured interviews were undertaken with suppliers from New Zealand agri-food exporting companies. The main factors that attracted suppliers to these supply chains were; increased price certainty, premium prices and relationship quality. Many suppliers wanted to break away from the agricultural commodity cycle, which they saw as disconnected from customer demand, and characterised by price volatility. They saw themselves as better than average producers with the ability to produce high quality products. They valued the relationship with the companies they supplied as this gave them access to premium markets where they felt they would be rewarded for their effort. There was a high level of trust in these relationships and this was built on openness and transparency in communications and confidence in the character of the company personnel. The success of differentiated agri-food supply chains requires capable and committed suppliers. Companies that are developing a differentiated strategy need to identify suppliers who have the ability to produce high quality products and want to be involved in a customer focused supply chain enables them to access to premium markets.

Jel Codes: Q13

Keywords: Supplier relationships; Commitment; Trust; New Zealand; Competitive advantage; Resource based view; Social capital

Background

The New Zealand economy is highly dependent on agri-food exports and is unique among the world's developed economies in that nearly two thirds of exports come from the agricultural sector. For example, Denmark and the Netherlands are the nearest comparable developed economies with significant agri-food export sectors, yet their agri-food exports represent only around 20% of these countries' total exports. The most significant of New Zealand's agri-food exports are dairy and red meat products. The dairy sector generated US$ 10.7 billion in export earnings in 2013, representing 28 per cent of total merchandise export value; while the red meat sector generated US $ 4.2 billion in export earnings (Statistics New Zealand 2013). New Zealand's efficient

pasture based production system and small population provide a low cost competitive advantage in the export of high quality meat and dairy products. This dependence, however, makes New Zealand vulnerable to changes in foreign government's policies and consumer demand in the importing countries, as well as competition from other low cost agri-food exporters.

New Zealand has traditionally relied on this low cost competitive advantage (Porter 1998) and focused on improving productivity and efficiency to preserve its position as one of the world's most efficient agricultural producers. This is now becoming more difficult to maintain with rising production costs and regulatory constraints on agricultural intensification. Because of this, many people are questioning if New Zealand still has a sustainable long-term, low cost competitive advantage. The alternative to maintaining this low cost position would be focusing, instead, on increasing the value of the product (Porter 1985b). This would require a fundamental shift in the focus of New Zealand agriculture. Instead of an emphasis on efficient farm production and increasing scale, the focus would need to be on meeting the needs of selected high value consumers. These consumers are demanding greater variety and quality in the food they eat. They require a consistent year-round supply of high quality, safe food (Fischer et al. 2009; Van der Vorst 2000). They also want food that aligns with their own personal values, which includes credence attributes such as environmental sustainability, animal welfare and fair trade, as well as local and organic production.

Meeting these consumer demands is difficult within the constraints of New Zealand's pasture based agricultural production system, where production volume and product specifications are highly dependent on climate. This leads to a fundamental question. Should New Zealand agriculture continue to focus on low cost, efficient production systems? Or, should it focus instead on developing higher value products, with innovative production systems that can deliver a consistent year-round supply of high quality, safe food and also address consumers' concerns for animal welfare and environmental stewardship? This change would be a significant challenge for the relationships in the supply chain. The New Zealand agricultural sector has traditionally relied on short-term spot market exchange relationships (McLeod et al. 2011). While these are efficient for large volumes of undifferentiated products they are less effective in meeting consumer needs for differentiated products (Sonka 2003). In a spot market transaction there is little information flow. Information flow is important with differentiated products where credence quality attributes, such as animal welfare are not visible in the physical product at purchase or, even, after consumption (Nelson 1970; Dyer and Singh 1998). Therefore, to meet these consumer needs the New Zealand agricultural industry would need to move away from relying

Table 1 Proprtion of NZ products exported

Product	Per cent exported	Main market	Per cent to main market 2013
Dairy products	97 per cent	China	32 per cent
Sheep meat	90 per cent	European Union	44 per cent
Beef	80 per cent	USA	43 per cent
Venison	90 per cent	European Union	76 per cent

(Statistics New Zealand 2013).

predominantly on a traditional commodity model with short-term, competitive, spot market relationships to a partnership model with increased supply chain commitment involving long-term contracts and to delivering of high quality products to meet customer demands (Fischer et al. 2009).

This would require suppliers who are willing to commit to meeting higher product specifications while working with less flexible delivery schedules. It would mean moving from a competitive model to a partnership model (Dwyer et al. 1987; Jae-Nam and Young-Gul 1999; Srinivasan et al. 2011). These partnerships are relationships based on mutual trust, openess, and where the responsibility, authority and decision-making are shared more evenly and there is often an agreement between the parties to share both risks and benefits. (UK Audit Commission 2012; Lambert et al. 1996). In one of a number of reports on the New Zealand red meat sector it was identified that the sector was dominated by commodity supply chains as opposed to differentiated value chains (McLeod et al. 2011). These authors indicated that to address the industry's problems there needed to be greater trust between processors and suppliers and incentives needed to aligned so that one sector did not profit at the expense of the other. There is, currently, little research on what influences farmers to commit to long-term supply chain partnerships. There is significant descriptive research on the characteristics of supply chain partnerships but little explanatory research. This research aims to address this.

New Zealand exports a high proportion of its agri-food products and, despite significant diversification, still relies on a small number of key markets.

China has recently become New Zealand's largest market for dairy products. Over the last 20 years China has moved from being the 31st largest export destination for New Zealand dairy products to the first. This market continues to grow strongly due to rising incomes and urbanisation in China. In contrast, the majority of lamb and venison is exported to the European Union (though China has recently become the largest market for sheep-meat outside of the European Union) (Table 1). Lamb benefits from being counter-seasonal to the European Union domestic supply and 40 per cent is exported by sea freight as chilled cuts. New Zealand has preferential market access for lamb to Europe, with a tariff-free quota of 228,254 tonnes. Venison is supplied into the European Union market primarily in the Northern Hemisphere autumn during the traditional game season, with Germany, the largest single market, taking 40 per cent of total venison exports (Statistics New Zealand 2013). The United States is the main market for New Zealand beef receiving forty per cent of exports with much of it destined for further processing into ground beef.

While dairy production is primarily pasture based there is increasing use of supplementary feeding and irrigation to reduce the impact of climate and to increase production. In contrast, New Zealand meat production is primarily produced on un-irrigated pastures with little use of supplements. This enables low cost, year-round outdoor grazing that produces natural, high quality meat products. It also means that production is highly seasonal with significant variation due to the climate (McLeod et al. 2011; Bensemann et al. 2011). Changes in pasture supply, driven by variations in temperature and rainfall play an important role in supply chain dynamics, affecting price, quality and timing of supply (Bensemann et al. 2011). This is compounded by seasonal and structural overcapacity in the meat processing industry, creating a highly competitive environment for procurement of supply.

Literature review and research framework

The primary objective of strategy is to create a competitive advantage (Barney and Hesterly 2010). Competitive advantage is the ability to produce greater economic value than competing firms (Porter 1985a; Barney and Hesterly 2008, 2010; Lin et al. 1981; Sonka 2003). Porter (1998) identifies three generic strategies firms can use to achieve competitive advantage. The first, a cost leadership strategy, emphasises efficiency and the production of high volumes of standardised products. This provides customers with similar products as competitors but at a lower cost. The second, described as a differentiation strategy, attempts to create products that consumers will pay more for because of attributes they value. The third strategy identifies the breadth of the targeted market segment, where firms attempt to better meet the specific customer needs for a particular market segment. This can involve either a low cost or a differentiated strategy depending of the mature of the market segment.

These generic strategies can also be applied at a supply chain level. Agri-food supply chains have traditionally used a low cost strategy with the provision of large volumes of undifferentiated products and spot market relationships (Sonka 2003). However, many agri-food supply chains are now moving to establish closer relationships with suppliers and customers so they can deliver differentiated products (Hobbs and Young 2001). As consumers demand greater quality and diversity in products and services, buyers need greater commitment from suppliers to ensure a consistent supply of the required quality (Kee-Hung et al. 2005; Fynes et al. 2005).

High levels of commitment mean that suppliers are willing to adapt to meet the required product specifications and committed suppliers will make relationship-specific investments and exert effort to satisfy the buyer (Buxton and Tait 2012). Committed suppliers will allocate the required resources (time, effort and money) to improve their supply chain performance. However, this commitment can also mean suppliers are vulnerable to opportunistic behaviour, especially where they have made relationship-specific investments (Liu 2012). Transaction cost economics identifies the risk of opportunistic behaviour as a determinant of transaction costs. Firms encounter transaction costs as they adopt governance mechanisms to address the risk of opportunistic behaviour (Williamson 1979). Trust is a more effective and lower cost governance mechanism than having formal contracts (Poppo and Zenger 2002; Dyer and Singh 1998; Liu 2012).

This is especially the case when there are complex exchanges requiring co-operation between partners (Poppo and Zenger 2002). Long-term, sustainable partnerships require a high level of collaboration between all parties in the supply chain and are characterised by high levels of trust, commitment, transparency and integrity (Kwon and Suh 2004; Srinivasan et al. 2011). These are also important factors in enabling the efficient and effective flow of information and the allocation of resources in a supply chain (Buxton and Tait 2012). These behaviours are necessary to enable companies to supply differentiated products to customers and achieve a sustainable competitive advantage.

The resource based view (RBV) states that competitive advantage comes from valuable and rare resources, and capabilities. If these are also hard to imitate and not substitutable then they can provide a long-term sustainable competitive advantage (Poppo and Zenger 1997; Barney 1991; Srinivasan et al. 2011). RBV identifies that it is the different resources these firms have that determines the differences in performance

between them (Wernerfelt 1984). Examples of the resources are brand names, technical knowledge, skilled human resources, inter-firm relationships, machinery, efficient operating procedures and financial capital. The RBV regards specific assets and, in particular, human assets as being critical to a firm's performance. These provide valuable knowledge and capabilities (Poppo and Zenger 1997). The RBV proposes that companies choose greater integration and more hierarchical governance mechanisms, because with greater investment in specific assets these forms of governance are more efficient (Poppo and Zenger 1997). Originally, the RBV focused only on the resource capabilities located within the individual firm (Barney 1991; Molina and Dyer 1999). However, later developments acknowledged evidence that firms can achieve supply chain productivity gains by making relational investments. Inter-firm relationships enable the combining of resources in unique ways that provide these partnerships with greater competitive advantage. This incorporates the relational exchange perspective into the RBV (Dwyer et al. 1987). This extends the original view of the RBV framework to incorporate intangible resources that exist beyond the boundaries of individual firms (Molina and Dyer 1999).

Firms engage in relationships with other firms to obtain access to complementary resources (Nooteboom et al. 2000). A partner can offer a range of valuable resources, including technical capability, organisational capability, flexibility, reliability, knowledge, innovative capability, network position, international presence and a low risk of discontinuity (Nooteboom 1999). Oliver (1997) suggests that strategic alliances allow firms to obtain assets, competencies or capabilities that cannot be easily purchased in a competitive market for resources. These are, in particular, intangible assets such as specialised technical knowledge, expertise or reputation. Collaboration creates a unique combination of resources that, when combined, have greater value than when on their own. These combinations mean that these resources are more valuable, rare and difficult to imitate (Molina and Dyer 1999). Therefore, long-term supply chain partnerships create a competitive advantage through a number of activities. Partnerships' investment in tangible and intangible relationship-specific assets not only includes things such as specialised machinery, but also includes relational assets such as trust. A significant exchange of knowledge and joint learning can take place that is specific to the relationship. Firms are able to combine scarce resources in complementary ways that enable them to improve quality and efficiency as well as to develop new products and technologies. Through relational governance mechanisms, they are able to lower transaction costs (Molina and Dyer 1999; Dyer and Singh 1998). These create relational rents, which are profits achieved through collaboration that are not able to be produced by each individual firm in isolation.

Social capital theory has become an important perspective within social exchange and social network theory. In incorporating a relational view of social exchange theory, social capital describes the relationship-specific resources that enable the relational rents and is concerned with the nature, structure and resources embedded in a person's network of relationships (Granovetter 1973; Seibert et al. 2001; Burt 1992; Lin et al. 1981). Social capital was initially described by Jacobs (1965), who referred to the networks of community relationships developed over time that provided a basis for trust, co-operation and collective action. Social capital includes the actual and potential resources as a result of relationship networks (Nahapiet and Ghoshal 1998a). Social

capital between buyers and suppliers allows them to gain access to, and leverage from, resources residing in their relationships. It reduces the likelihood of conflicts and promotes co-operative behaviour through trust, common goals and social bonds (Villena et al. 2011). Social capital is categorised as cognitive, relational or structural (Nahapiet and Ghoshal 1998b; Villena et al. 2011). Cognitive social capital involves shared visions, goals and culture or, in other words, what you have in common. Structural social capital refers to the overall pattern of connections between actors, in other words, who you have contact with and how you have contact with them (Nahapiet and Ghoshal 1998a). Relational social capital refers to personal relationships of trust, friendship, respect and reciprocity developed through a history of interactions that influences behaviour (Nahapiet and Ghoshal 1998a; Granovetter 1992). Social capital theory is closely aligned with the network view. It assumes that inter-firm relationships are embedded in a network structure (structural social capital), and this affects the behaviour and expectations of firms (Omta et al. 2001). Relational and cognitive social capital describes the characteristics of these network relationships. Many traditional studies of supply chain relationships take a limited linear view and only analyse the dyadic relationships between firms in the supply chain. This approach ignores the complex interdependencies and relationships between firms that exist in a larger supply network (Wilson 2011; Choi and Wu 2009).

This literature review was used to provide a theoretical framework for the research project and shape the interview questions. A resource-based view incorporating social capital theory was the primary lens through which the supplier relationships were viewed. From this it is proposed that suppliers seek to maximise the long-term value of their resources and capabilities. This means they seek to develop and acquire valuable and rare resources and capabilities that are difficult to copy, and this leads to a sustainable competitive advantage. These resources comprise their physical farm resources, which include the soils, topography, climate, location as well as physical structures and buildings. It also refers to their human resources, which include their farm management ability as well as the social capital resources that exist in the relationship with their buyer. Suppliers who are committed to long-term relationships seek to maximise the value of their productive resources by seeking complementary resources in their supply chain partners that can add value to their existing resources as well as create new resources and capabilities. The shared social capital resources are what provide the connections and bonds that facilitate access to these resources.

The main objective of this research is to contribute to the knowledge and understanding of supply chain relationships in the agri-food sector. This will provide a better understanding of how to create long-term committed partnerships between suppliers and buyers in order to meet the higher product specifications and delivery schedules required by international consumers. The research identifies the characteristics of long-term successful supplier/processor/retailer partnerships in New Zealand agri-food supply chains as well as the characteristics of the participants. It identifies how these long-term partnerships create value through co-operation. The research identifies the factors that enable long-term co-operation to occur, as opposed to short-term, opportunistic behaviour and how this co-operative behaviour is maintained.

Methods

The study employed a qualitative case study approach to explore the factors that attract suppliers to be committed to long-term supply relationships in agri-food supply chains. In particular where suppliers are require to consistently deliver to high product specifications. An exploratory case study method was used in order to gain insight into the complex factors that contribute to the formation of long-term supply commitments in agri-food supply chains. Case study research can involve single or multiple cases (Yin 2003). A multiple case study approach was used as this provides advantages in identifying patterns and enables the triangulation of the results.

Semi-structured interviews were undertaken with suppliers from three New Zealand agri-food exporting companies between May 2012 and October 2013. The companies selected all had a focused-differentiation strategy (Porter 1985b) and the products exported included, beef, lamb and venison, and their key markets were in the European Union, North America, Asia and the Middle East. The suppliers were required to meet high product specifications in terms of timing of delivery, food safety, traceability, environmental sustainability, animal welfare and product quality. The suppliers interviewed were located in both the North and South Islands of New Zealand and were from the regions of Canterbury, Otago, Manawatu, Wairarapa, Hawkes Bay and Waikato.

The aim was to understand the characteristics of long term supply chain relationships and the motives of the suppliers who choose to commit to these. The interviewer had a list of questions and topics but an attempted to be led by the supplier in order to ensure the questions didn't limit the scope of the interview and that other important aspects of the supply relationship were not missed. A list of the interview script is provided in Appendix 1. The suppliers were asked what they valued in their relationships with these companies and the benefits they received. The interviews focused on factors such as price and price certainty, relationship quality, benchmarking and information sharing. They were also asked about the costs and risks from supplying these companies.

The producers were asked what they valued in their supply relationships and the benefits they had received. They were also questioned about the disadvantages of supply relationship. The study was exploratory in nature and attempts were made to ensure validity. External validity was achieved through proximity and similarity (in the selection of companies that had similar strategies but different products and markets (Campbell 1986). Internal validity was assured through the number of supplier informants selected within each group while suppliers were selected by the companies involved to provide a broad range of perspectives. They ensured that there were less satisfied suppliers included as well as more contented suppliers.

The case studies were selected to provide perspectives about different companies exporting different products to a range of different markets (Eisenhardt 1989). The criteria for a company's selection was that the company had suppliers who committed to supply on contract with specific product specifications in terms of timing of delivery, food safety, traceability, environmental sustainability, animal welfare and product quality. These suppliers need to keep farm management records and on farm management practices are audited to ensure they meet required animal health and welfare as well as environmental sustainability standards. The suppliers also need to meet specific specifications for things such as the age and weight of the animal and fat cover. The suppliers

belonged to "producer groups" where they were had an ongoing supply commitment to the New Zealand exporter. In some cases they produced to requirements of particular retail customer or to specific quality specifications that met the requirements of a number of retail customers. These retail customers often visited the suppliers in New Zealand to communicate with the farmers and understand the farming and production practices in New Zealand.

The companies had to be exporting to high end wholesale or retail customers in the European Union, North America, Asia and the Middle East. The companies were selected to cover beef, lamb and venison export supply chains such that the main New Zealand meat exports were covered. Face-to-face semi-structured on-site interviews were the primary method of data collection. The interviews took between an hour to an hour and a half to complete. A total of 30 suppliers were interviewed from five different producer groups. These were complemented with secondary data such as published company information, supply agreements and newspaper reports. Other secondary data included observations at supplier field days and informal personal communication with suppliers and company personnel. Secondary data provided additional information and validation of the interview data.

Results and discussion

The suppliers from the three companies interviewed had a number of common characteristics that reflected their physical, human and social capital resources and capabilities (Figure 1). The combination of these resources enables these suppliers to develop distinctive competencies. These are unique strengths that enable these suppliers to efficiently deliver reliable supplies of high quality products that meet customer requirements (Hill and Jones 2008). These suppliers choose to commit to these high specification supply chains because it gives them access to complimentary resources, which enables them to maximise the returns on their distinctive competencies. These complimentary resources are the customer relationships, reputation, marketing skills, communication and supplier relationship skills of the companies they supplied.

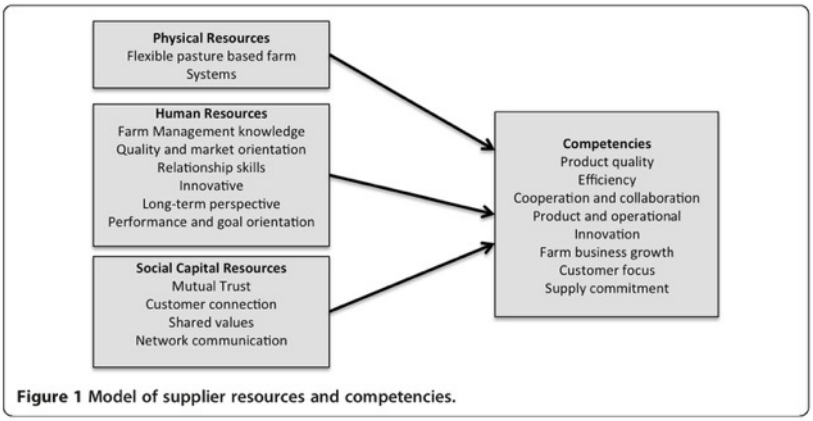

Figure 1 Model of supplier resources and competencies.

The suppliers had farm systems that they could adapt to produce consistently high quality products with more demanding delivery schedules. This involved land and climate resources that enabled a level of production flexibility, or they could achieve this through use of forage crops, irrigation or other stock to balance pasture supply and demand. This was evident when interviewing less committed suppliers as the most common issue they mentioned was the reduced flexibility in delivery timing and quality these supply chains required. This was most significant for suppliers that had farms where summer rainfall was unreliable and soils had little water storage without irrigation.

"We like to be quite flexible and move quite quickly but these things didn't allow us to move as quickly as we would have liked".

"We are a sheep and beef breeding business and our key performance indicator is our ewe production. Trading stock have become a big part of our system so that at any time when its dry, late winter or summer, we can just cut the trading stock".

"Commitment has a cost to it and the reason being that I can't just go and market all my cows as in-calf. Getting involved in this supply chain means we make a commitment that we won't change that policy for the long term and that has a cost. I could sometimes make more money by going to trading".

The human resources and capabilities were a significant factor in the characteristics of these suppliers. They were all capable producers with a high level of farm management ability. Combined with this was a high level of motivation and ability to innovate. They described themselves as progressive farmers, and had a strong desire to develop and grow their farm business. This did not always mean physical expansion but was often about positioning their business to adapt to future changes. As a result they were hungry for information and knowledge that would enable them to improve their farm performance.

"I'd like to see my figures against other suppliers. It's not necessarily to prove I'm the best but just for my satisfaction of seeing where we are and can we improve, and if not, if I'm not up there, then what can I do"

"I think that's what we all need to do. All farmers need to stop being average; It is probably going to be a contradiction of terms. Some farmers farm because that's what they do and some farmers farm because they have to make money".

The desire to create and acquire new knowledge resources was a key characteristic of these suppliers. They valued collaboration and interaction with other like-minded farmers. Collaboration, which enabled the exchange of information and ideas with other capable and innovative farmers, helped them jointly create new knowledge and learning and to develop their existing resources and capabilities. Receiving a premium price for their products was also important. They felt they were "better than average" suppliers and had the capability and resources to produce a high quality product to tighter specifications and, therefore, wanted to receive a reward for this.

"The premium is good but other things are as well. It gives you a pat on the back and know you are doing a good job basically"

"It's important to me to get a premium price and knowing you are doing the right thing to get it"

"The key services for us are providing a good sort of marketing to try and promote high quality beef and sending it to an end market that can pay top dollar for the top product"

"We want to produce a top quality product and a high value with it. We want to know whoever we are moving that product onto is working on the same strategy rather than developing a product and not getting the value out of the market place" ,

"The premium price is important because we have lots of options here for farming different classes of stock and we pretty much work things back to cents per kg dry matter" .

They also had a long-term perspective and wanted to ensure their business was able to adapt to future challenges and changes in the industry. They were goal orientated and motivated by setting both short and long-term goals. The suppliers achieved a great deal of satisfaction from achieving goals and improving performance.

"This year I set a goal at the start of the season and then try to do things as well as I should to achieve that goal. It might seem like a small thing but it's satisfying"

"I definitely take a longer term view maybe the margin should be higher that you're getting but I accept that well that may not be happening now, but it should happen in the future".

"I like the results they give us, the spreadsheet, the benchmarking. I do like that it gives us something to aim for".

The suppliers had strong relationship skills, which enabled them to work cooperatively with other suppliers, and the companies they supplied. They were committed to working co-operatively with other suppliers and other parts of the supply chain. They had learned the benefits of collaboration and working together to create value.

"The thing is you're not competing against anyone; you're not competing on the open market so if you improve your performance it doesn't matter".

"So because you're in this group there's obviously an incentive to actually improve the performance of the whole group" .

"There's a strong need for this, a sense of reciprocity, where there's give and take and so I accept that I'm not getting the maximum this year but that's going to pay off in the future. So that's why a key person that's in the group has to be looking long term" .

"The whole point of this group is that it's about the good of the group as a whole"

They also had a strong focus on producing high quality products and got a great deal of satisfaction out of this. Many expressed that they were committed to producing high quality products and would do this regardless of the premium received.

"Focusing on quality rather than quantity; if we were focusing on quantity we would be running bulls and trade lambs all over the show. I could make more money by selling all my lambs to sale yards right now rather than having a committed contract, but we don't believe that that is the future of the industry."

They were also customer and market focused. Knowing who the customer was gave them a sense of satisfaction and also gave them assurance that they were adapting their farm system to customer demand; this reduced their perceived risk. Customer connection provided them with personal satisfaction of knowing their efforts to produce a high quality product was appreciated and valued.

"If I left this relationship the customer connection would be one of the main things I would be losing or missing out on."

"The attraction of this supply chain model is you have got a connection with the customer so you can actually see where the money is going and you know the money is all being recycled in the group."

"We like the fact that they are not a normal old beef animal, they are going to a specific market and you are putting the trust in the people who are selling it for you. It is nice to be a little bit more connected to the market of a prime product, which gives us a sense of satisfaction in the quality of what we sell" .

"That connection to the customer is really important and that gives you a sense of satisfaction of what you're producing. You know where it's going; it's the whole traceability thing. You know it's going to the top end of the market" .

It was clear that these supply chains had significant relationship specific resources. These connections were with the companies they supply, downstream customers as well as other suppliers. These social capital resources enabled suppliers to reduce costs, increase value and reduce risk, which leads to an increase in competitive advantage. A key aspect of the cognitive social capital in the supply chain was shared goals and values. Many suppliers were attracted to these supply chains because they had a common vision with the other supply chain members. This involved producing a high quality product and delivering to customer demands. They wanted to move away from producing commodities and focus on creating more value by meeting customer expectations and being rewarded for doing that.

"I was attracted to this from a marketing point of view; this is the only way we are going to get out of the commodity cycle,"

"We want to produce a top quality product and a high value with it. We want to know that whoever we are moving that product onto is working on the same strategy rather than developing a product and not getting the value out of the market place,"

"Because they're a marketing company that actually aligns with my philosophy over the fact that we should be marketers, not salesmen"

The other members of the supply chain brought complimentary marketing resources that enabled the suppliers to realise a better return from the resources they invested in their farm production. Relational social capital was evident in the strong mutual trust that existed in the supplier–buyer relationships as well as in the horizontal relationships with other suppliers. This was supported by structural social capital with regular interaction and honest communication.

"Totally, totally, I mean, I totally trust all the guys, what they're doing."

Mutual trust and honest communication was also critical as it reduced the risk associated with opportunistic behaviour and enabled them to adapt more quickly to changing market conditions and consumer demands.

"Well one of the things that would damage the relationship would be if they were trying to keep things secret or not telling us. You have to have a fairly good level of trust that they are not hiding any information from you or that they are openly sharing the information that they have."

This social capital was extended through the supply chain to the wholesale and retail customers who often visited suppliers. In some case suppliers had visited the markets and interacted with customers and consumers with in store tastings.

"We were attracted to the scheme because it was not only the price but we knew our meat was going to a specific market – not just disappearing. The Japanese were coming over to and having a look round some farms, which I thought, was good. They took an interest in where the meat came from and made an effort".

Customer connection was important as this provided valuable knowledge exchange and learning. With a greater familiarity about customer needs the suppliers felt they could make strategic investments in their farm production that would create more customer value. The enduring relationships and mutual trust in the supply chain meant that long-term pricing arrangement could be established. The suppliers valued long-term stable prices as this reduced their income volatility. This also enabled improved planning and the ability to invest and focus on maximising production rather than reacting to changing commodity prices. Stable prices gave them better access to financial resources, as banks were more willing to lend if product prices were more predictable.

"You know what the end result is so you can work on margins"

"Having a fixed price is important. You can plan, budget and work towards a good solid outlooks that's consistent. I am not saying they have to have the best price all the time but it's always a big one. As a farmer I can spend the rest of the year planning my crop, changing my rotation to target that"

"What attracted me was the opportunity for a fixed price and focusing on a high value product."

"When I figure out how quickly I can grow them I can go to the bank manager and say that amount of money will come in at that time of year. There is no fluctuation and that for our business going forward is going to be hugely valuable."
"It allows you to focus on improving your farming performance rather than worrying about what the market price is doing".

Relationship quality was important to the suppliers as they sought to establish relationships of mutual trust and reciprocal commitment with their supply chain partners. These aspects of social capital enabled them to mitigate the risk of adapting their production to specific customer requirements and to reduce transaction costs.

"I look after them and they get everything. In return he looks after me and it's a mutual relationship"

Conclusions

The suppliers in the this research confirmed the social capital and resource-based theoretical framework whereby suppliers commit to long-term differentiated supply chains as a strategy to maximise the value of their existing resources and capabilities. They also sought to create opportunities to further develop existing resources through acquiring new resources and capabilities, or to access to complementary assets through their supply chain relationships. This confirmed the resource-based view that firms seek to create a sustainable competitive advantage by controlling valuable and rare resources and capabilities that are difficult to copy. The research also confirmed the social capital perspective as these suppliers saw value in the relational resources that included common goals, mutual trust, communication and social interaction. The suppliers benfited by having long term stable relationships and connection to high value customers. They were able to better customise their production system to meet market demands. This reduced the market risk and also gave them long term stable prices.

The suppliers sought out differentiated supply chains as they identified these as creating greater value for their existing resources. They already have high farm management capabilities as well as quality farm resources so have a greater ability to produce to higher specification products with less flexible delivery requirements. They also have existing social resources in terms of abilities to co-operate and work with others. They have a high level of absorptive capacity, and therefore, can more easily acquire and incorporate new knowledge into their farm systems. The companies they supply provided them with access to complementary resources in the form of access to premium markets where they can achieve greater returns on their resources and capabilities. The social capital resources that existed in the supply chain relationships enabled them to reduce the transaction costs due to their investment in relationship-specific assets.

The case studies showed that it is possible for New Zealand to develop higher value differentiated supply chains with committed long-term relationships. This however, requires a specific set of resources and capabilities that are by definition, rare and difficult to copy. This will only ever be a strategy for a part of the New Zealand agri-food

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industry. New Zealand needs to develop a diversity of strategies for suppliers and exporters. Individual producers and exporters will choose to supply different types of supply chains within a continuum between spot markets and vertical integration. This will be based on their perception of the way they can maximise the value of their existing resources and capabilities. For example, suppliers with a lower ability to produce or manage consistent quality may maximise their returns by having flexibility in their market arrangements and quality specifications. However, the current industry model is still dominated by commodity supply chains. There is, therefore, a need to specifically support the companies and their suppliers as they were developing these higher value strategies.

The success of differentiated agri-food supply chains requires capable and committed suppliers. This requires significant investment in developing relationships and careful selection of suppliers. Companies developing a differentiated strategy need to identify suppliers who have the ability to produce high quality products and want to be involved in a customer-focused supply chain that provides them with access to premium markets. Companies can build commitment and trust with suppliers through open and transparent communication. They also need to invest in marketing and customer relationships to provide suppliers with access to premium markets so they can be rewarded for the quality of the products they produce.

Although these committed, differentiated supply arrangements will not suit all suppliers, improving the overall resources and capabilities of producers will mean a greater proportion will choose these supply chains as their optimum strategy. This has important implications for policy makers, researchers and for extension services. Private companies, government agencies and industry organisations can support programmes that improve farmer management capability as this will improve the performance of these supply chains as well provide a greater pool of suppliers capable of delivering to these more demanding specifications. New Zealand farm management research has traditionally focused on maximising farm efficiency and reducing costs rather than improving the quality of the product to meet specific customer requirements. More investment needs to be made into research that efficiently adds value rather than on lowering costs.

Farmers need to have both the capability and the motivation to be involved in these supply chains. Many farmers have little awareness of customer demands or opportunities in the market; therefore, promoting knowledge and awareness of market needs and supply chain opportunities is important for providing the understanding and motivation to meet customer needs. Providing resources to improve the physical resources of farms through such things as investment in irrigation systems, improved pasture species and developing enhanced soil quality can improve capability. Providing investment in research and development, and developing farmer knowledge that is specifically targeted at delivering to the specifications of these supply chains, will enable more farmers to have the capability to commit to supplying these customers.

Appendix 1

Interview questions

1. What attracted you to first join the producer group?
2. Why do you think other producers don't join the producer group?

3. What do you think would get more suppliers to join the producer group?
4. What do you value most from being a part of producer group?
5. What do you see as the main benefits of belonging to producer group?
6. How satisfied are you with the performance of your producer group processor/marketer?
7. What do you see as the risks of the being part of the producer group?
8. What do you see as the main costs/disadvantages of belonging to producer group?
9. What do you see as the key services provided by the producer group and how well are these services being delivered today?
10. What would you value that producer group processor/marketer is not currently providing?

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